SSC Junior Engineer Online Exam Mechanical Engineering SOLVED PAPERS TECHNICAL & NON-TECHNICAL

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SSC Junior Engineer Paper Syllabus

MECHANICAL ENGINEERING

The Examination will be conducted in two stages :

A. Paper-I (Pre) (200 marks)

B. Paper-II (Mains) (300 marks)

Total Written Test (500 marks)

Written Test :

Paper	Subject	Number of Questions/ Max. Marks	Duration & Timing
Paper-I Objective type	(i) General Intelligence & Reasoning(ii) General Awareness(iii) General Engineering (Mechanical)	50 /50 50 / 50 100 / 100	2 Hours
Paper-II Objective type	General Engineering (Mechanical)	100/ 300	2 Hours

There will be **negative marking equal to one-fourth (1/4) of the marks** allotted to the question for each wrong answer in Paper-I & negative marking of one mark for each wrong answer in Paper-II.

Syllabus of Examination

The standard of the questions in Engineering subjects will be approximately of the level of Diploma in Mechanical Engineering from a recognized Institute, Board or University recognized by All India Board of Technical Education. All the questions will be set in SI units. The details of the syllabus are given below.

Paper-I

- General Intelligence & Reasoning: The Syllabus for General Intelligence would include questions of both verbal and non-verbal type. The test may include questions on analogies, similarities, differences, space visualization, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationships, arithmetical computations and other analytical functions.
- <u>General Awareness</u>: Questions will be aimed at testing the candidate's general awareness of the environment around him/her and its application to society. Questions will also be designed to test knowledge of current events and of such matters of everyday observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining to History, Culture, Geography, Economic Scene, General Polity and Scientific Research, etc. These questions will be such that they do not require a special study of any discipline.
- General Engineering : Civil and Structural, Electrical & Mechanical

Mechanical Engineering

Theory of Machines and Machine Design, Engineering Mechanics and Strength of Materials, Properties of Pure Substances, 1st Law of Thermodynamics, 2nd Law of Thermodynamics, Air standard Cycles for IC Engine Performance, IC Engines Combustion, IC Engine Cooling & Lubrication, Rankine cycle of System, Boilers, Classification, Specification, Fitting & Accessories, Air Compressors & their cycles, Refrigeration cycles, Principle of Refrigeration Plant, Nozzles & Steam Turbines. Properties & Classification of Fluids, Fluid Statics, Measurement of Fluid Pressure, Fluid kinematics, Dynamics of Ideal fluids, Measurement of Flow rate, basic principles, Hydraulic Turbines, Centrifugal Pumps, Classification of steels.

Detailed Syllabus JE Mechanical Engineering

Theory of Machines and Machine Design

■ Concept of simple machine, Four bar linkage and link motion, Flywheels and fluctuation of energy, Power transmission by belts – V-belts and Flat belts, Clutches – Plate and Conical clutch, Gears – Type of gears, gear profile and gear ratio calculation, Governors – Principles and classification, Riveted joint, Cams, Bearings, Friction in collars and pivots.

Engineering Mechanics and Strength of Material

Equilibrium of Forces, Law of motion, Friction, Concepts of stress and strain, Elastic limit and elastic constants, Bending moments and shear force diagram, Stress in composite bars, Torsion of circular shafts, Bucking of columns – Euler's and Rankin's theories, Thin walled pressure vessels.

Thermal Engineering

Properties of Pure Substances:

■ P-V & P-T diagrams of pure substance like H₂O, Introduction of steam table with respect to steam generation process; definition of saturation, wet & superheated status. Definition of dryness fraction of steam, degree of superheat of steam. H-S chart of steam (Mollier's Chart).

<u>1st Law of Thermodynamics</u> :

Definition of stored energy & internal energy, 1st law of Thermodynamics of cyclic process, Non-Flow Energy Equation, Flow Energy & Definition of Enthalpy, Conditions for Steady State and Steady Flow; Steady State Steady Flow Energy Equation.

2nd Law of Thermodynamics :

■ Definition of Sink, Source Reservoir of Heat, Heat Engine, Heat Pump & Refrigerator; Thermal Efficiency of Heat Engines & co-efficient of performance of Refrigerators, Kelvin – Planck & Clausius Statements of 2nd Law of Thermodynamics, Absolute or Thermodynamic Scale of temperature, Clausius Integral, Entropy change calculation of ideal gas processes. Carnot Cycle & Carnot Efficiency, PMM-2; definition & its impossibility.

<u>Air standard Cycles for IC engines</u> :

Otto cycle; plot on P-V, T-S Planes; Thermal Efficiency, Diesel Cycle; Plot on P-V, T-S planes; Thermal efficiency.

IC Engine Performance, IC Engine Combustion, IC Engine Cooling & Lubrication.

Rankine cycle of steam :

Simple Rankine cycle plot on P-V, T-S, H-S planes, Rankine cycle efficiency with & without pump work. Boilers; Classification; Specification; Fittings & Accessories : Fire Tube & Water Tube Boilers. Air Compressors & their cycles; Refrigeration cycles; Principle of a Refrigeration Plant; Nozzles & Steam Turbines

Fluid Mechanics & Machinery

Properties & Classification of Fluid :

■ Ideal & real fluids, Newton's law of viscosity, Newtonian and Non-Newtonian fluids, compressible and incompressible fluids.

Fluid Statics : Pressure at a point.

Measurement of Fluid Pressure : Manometers; U-tube, Inclined tube.

Fluid Kinematics : Stream line, laminar & turbulent flow, external & internal flow, continuity equation.

Dynamics of ideal fluids : Bernoulli's equation, Total head; Velocity head: Pressure head; Application of Bernoulli's equation.

Measurement of Flow rate Basic Principles : Venturimeter, Pilot tube, Orifice meter

Hydraulic Turbines : Classifications, principles

Centrifugal Pumps : Classifications, Principles, Performance.

Production Engineering

Classification of Steels :

Mild steal & alloy steel, Heat treatment of steel, Welding – Arc Welding, Gas Welding, Resistance Welding, Special Welding Techniques i.e. TIG, MIG, etc. (Brazing & Soldering), Welding Defects & Testing; Foundry & Casting – methods, defects, different casting processes, Forging, Extrusion, etc, Metal cutting principles, cutting tools, Basic Principles of machining with (i) Lathe (ii) Milling (iii) Drilling (iv) Shaping (v) Grinding, Machines, tools & manufacturing processes.

Exam.	Year	Total Question	Total Question
Pre/Mains		(Technical)	(Non-Technical)
SSC-JE	2024 (5 June Evening)	100	100
SSC-JE	2024 (7 June Morning)	100	100
SSC-JE	2023 (09 October Evening)	100	100
SSC-JE	2023 (11 October Evening)	100	100
SSC-JE	2022 (14 November Evening)	100	100
SSC-JE	2022 (16 November Evening)	100	100
SSC-JE	2021 (22 March Morning)	100	100
SSC-JE	2021 (22 March Evening)	100	100
SSC-JE	2020 (11 December Morning)	100	100
SSC-JE	2020 (27 October Morning)	100	100
SSC-JE	2020 (27 October Evening)	100	100
SSC-JE	2020 (28 October Evening)	100	100
SSC-JE	2019 (25 September Evening)	100	100
SSC-JE	2019 (27 September Morning)	100	100
SSC-JE	2019 (27 September Evening)	100	100
SSC-JE	2018 (22 January Morning)	100	100
SSC-JE	2018 (22 January Evening)	100	100
SSC-JE	2018 (23 January Morning)	100	100
SSC-JE	2018 (23 January Evening)	100	100
SSC-JE	2018 (24 January Morning)	100	100
SSC-JE	2018 (24 January Evening)	100	100
SSC-JE	2018 (25 January Morning)	100	100
SSC-JE	2018 (25 January Evening)	100	100
SSC-JE	2018 (27 January Morning)	100	100
SSC-JE	2018 (27 January Evening)	100	100
SSC-JE	2018 (29 January Morning)	100	100
SSC-JE	2018 (29 January Evening)	100	100
	Ν	IAINS	
SSC-JE	2023 (04 December) Mains	100	
	Total	2800	2700

SSC JE Mechanical Engineering Previous Papers Analysis Chart

Mechanical SSC JE Topic wise Analysis Chart

																		-				
	YEAR	SSC JE 22 Jan. 2018 (M)	SSC JE 22 Jan. 2018 (E)	SSC JE 23 Jan. 2018 (M)	SSC JE 23 Jan. 2018 (E)	SSC JE 24 Jan. 2018 (M)	SSC JE 24 Jan. 2018 (E)	SSC JE 25 Jan. 2018 (M)	SSC JE 25 Jan. 2018 (E)	SSC JE 27 Jan. 2018 (M)	SSC JE 27 Jan. 2018 (E)	SSC JE 29 Jan. 2018 (M)	SSC JE 29 Jan. 2018 (E)	SSC JE 25 Sep. 2019 (E)	SSC JE 27 Sep. 2019 (M)	SSC JE 27 Sep. 2019 (E)	SSC JE 11 Dec 2020 (M)	SSC JE 27 Oct. 2020 (M)	SSC JE 27 Oct 2020 (E)	SSC JE 28 Oct. 2020 (E)	SSC JE 22 March 2021 (M)	COL II JA Manual 1001 (EV
	Mechanics	3	-	3	3	2	_	2	5	4	3	4	4	1	2	2	3	4	2	-	1	1
	SOM	11	15	13	7	13	14	12	10	4	12	11	12	3	3	2	3	2	4	5	4	
	ТОМ	14	16	13	16	14	15	15	14	14	13	13	15	2	3	1	3	2	-	2	3	
	DOM	2	2	1	6	2	_	2	1	2	4	2	2	2	1	3	-	3	2	5	1	1
	FM	29	21	22	29	18	29	25	18	30	21	18	19	19	27	23	22	24	25	23	28	2
	HM	-	8	10	1	11	_	1	11	I	8	`12	11	12	7	11	8	10	7	13	7	4
6	TD	11	16	18	10	16	9	10	21	11	15	16	18	11	10	9	11	11	7	8	7	1
	PP	9	8	5	7	10	10	11	6	11	8	3	7	20	20	24	24	20	23	20	20	1
	НТ	-	_	-	_	_	_	_	_	I	١	I	1	_	_	_	-	1	1	_	-	-
	RAC	1	0	2	1	0	_	1	-	3	1	1	1	12	10	8	6	10	10	9	11	1
	IC Engine	10	6	3	12	6	14	8	4	11	5	9	5	13	12	11	10	7	10	11	12	1
	WT	1	-	3	_	1	-	1	3	-	6	1	2	_	-	-	1	-	-	_	2	ĺ
	РТ	-	4	3	1	3	1	1	4	4	2	7	3	_	-	-	1	_	1	2	_	
	EM	8	3	3	7	3	8	6	3	6	1	3	1	5	5	6	3	6	6	2	3	4
	MMED	-	1	1	-	1	_	_	_	-	1	-	1	_	_	_	_	-	2	_	1	-
	Miscellaneous	1	_		_	_	_	_	4	-	_	_	-	_	_	-	5	_	_	_	_	1
	TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	1

Mech.- Mechanics, SOM – Strength of Materials, TOM – Theory of Machines, DOM – Design of Machine, FM – Flu Machines, TD – Thermodynamics, PP – Power Plant Engineering, HT – Heat Transfer, RAC – Refrigeration and Air Conditioning, Engine, WT- Workshop Technology, PT – Production Technology, MMED- Mechanical Measurement and Engineering Drawing, E.

SSC Junior Engineer Mechanical Online Exam 2018 CPWD/CWC/MES

Mechanical Engineering

Time : 10.15 am]

[Exam Date : 22 January, 2018



SSC JE Online Mechanical 2018 (Ex. date 22 1. 2018) 10.15 am



17. In the following question, select the odd Justice number from the given alternative. Justify (a) 2-4 (b) 3-9 Juvenile -Last position (c) 4–18 (d) 5-25 So, the word 'Juvenile' will come at last position. Ans: (c) A series is given with one term missing. Select 22. (b) $3^2 = 9$ (a) $2^2 = 4$ the correct alternative from the given ones that (c) $4^2 \neq 18$ (d) $(5)^2 = 25$ will complete the series. F, M, T, ?, H, O The square of 4 is equal to 16 but in the given option is (a) B equal 18. So, option (c) is the odd number from given (b) C alternatives. (c) А (d) D 18. In the following question, select the odd Ans : (c) number pair from the given alternatives. 13 20 1/27 8 15 6 (a) 76–42 (b) 92-20 F T A H O M (c) 73-21 (d) 93-27 Ans : (b) +7 +7 +7 +7 +7 (a) $76 - 42 \Rightarrow 7 \times 6 = 42$ **Note-** A = 1 or 1 + 26 = 27(b) $92 - 20 = 9 \times 2 = 18 \neq 20$ 23. A series is given with one term missing. Select (c) $73 - 21 = 7 \times 3 = 21$ the correct alternative from the given that will (d) $93 - 27 = 9 \times 3 = 27$ complete the series. So, the option (b) is different from the given ROK, LIE, FCY, ZWS, ? alternatives. (b) SRV (a) LAQ Arrange the given words in the sequence in 19. (c) TQM (d) FMQ which they occur in the dictionary. Ans: (c) (1) Flagrant (2) Flavour (3) Flatter (4) Flick (5) Flawed (a) 13254 (b) 31254 23541 (d) 32541 (c) Ans : (a) Arrangement of the words according to the So, TQM, are the correct alternatives from the given sequence in the dictionary arethat will complete the series. (i) Flagrant 24 A series is given with one term missing. Select (ii) Flatter the correct alternative from the given ones that (iii) Flavour will complete the series. (iv) Flawed FAQ, LGW, RMC, ?, DYO (v) Flick (a) VIR (b) XSI 20. According to dictionary, which of the following (c) LSI MIS (d) word will come at THIRD position? Ans : (b) (1) Heritage (2) Helpful (3) Hectic (4) Heroic R (5) Heroism 19 13 (a) Hectic (b) Heritage ± 6 S (c) Heroic (d) Helpful 15 Ans: (b) Arrangement of words according to dictionary are-So, XSI are the term which is complete the series. Hectic In the following question, select the missing 25 Helpful number from the given alternatives. -3^{rd} position Heritage 14, 22, 49, 113, 238, ? Heroic (a) 386 (b) 532 Heroism 454 576 (c) (d) So, the word 'Heritage' will come at third position. Ans : (c) 21. From the given alternatives, according to 113 dictionary, which word will come at LAST 14 238 position? 1125 (b) Justify (a) Juvenile (c) Judge (d) Justice $(2)^{\circ}$ (3)(4) $(5)^{\circ}$ (6)Ans : (a) Arrangement of words according to dictionary So, the missing number is 454 from the given arealternatives. Judge

SSC JE Online Mechanical 2018 (Ex. date 22 1. 2018) 10.15 am







45. Which of the following Venn diagrams 49. represents the relationship between Butterflies, **Animals and Insects?**



Which answer figure will complete the pattern **46**. in the question figure?



Ans: (c) The pattern in the question figure is completed by the answer figure (c).

47. From the given answer figures, select the one in which the question figure is hidden/embedded.



Ans: (c) The question figure is hidden/embedded in the answer figure (c).

A piece of paper is folded and punched as 48. shown below in the question figures. From the given answer figures, indicate how it will appear when opened.



If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?





50. A word is represented by only set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as shown in the given two matrices. The columns and rows of Matrix-I are numbered from 0 to 4 and that of Matrix-II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, for example 'C' can be represented by 43, 41 etc and 'O' can be represented by 97, 78 etc. Similarly, you have to identify the set for the word 'SPAN'.

				Ma	ntrix-	। आ	व्यूह-]	I		
		0			1		2	3		4
	0	M			Μ		Μ	1		Е
	1	A			Μ		J	1		Α
	2	F			Ι		Μ	1		Е
	3	Ι			J		Α	L		K
	4	D			С		Α	С		L
]	Mat	trix-l	।। आ	व्यूह-]	П		
		5			6		7	8		9
	5	N			V		Q	U		S
	6	R			S		Т	U		Ν
	7	S			Z		X	0		V
	8	X			S		Р	W		Р
	9	U			X		0	Y		Y
	(a) (56, 87,	33,	56		(b)) 59	9, 78, 4	2,	31
	(c) 8	86, 89,	32,	55		(d)) 78	8, 43, 2	22,	98
Ans :	(c)									
(8	a)	66	87		33		56			
		S	P		L		V	-	WI	rong
(ł)	59	78		42		31			
		S	0		Α		J	-	WI	rong
(0	c)	86	89		32		55		_	
,	1\	S	P		A		N	-	R	light
(0	1)	/8	43		22		98			
a 1	C F	0	C		M		Y	_	WI	rong
So, th	e SP	AN is	repi	esei	nted	by t	he se	t of n	um	ber i.e.
86,89,	,32,55									

SSC JE Online Mechanical 2018 (Ex. date 22 1. 2018) 10.15 am 13

51. Preliminary expenses are the examples recognized human development as development as	s the core of
of	
(a) Capital expenditure (b) Ninth five year plan	
(b) Capital gain (c) Tenth five year plan	
(c) revenue expenditure (d) Eleventh five year plan	
(d) deferred revenue expenditure	was based on
Ans. (a) : Capital expenditure is the example of the John W Muller model of influence in	the form of
preliminary expenses. Capital expenditures are those emphasis on infrastructure. In this plan the hu	man resource
governmental expenditure, which is helpful in making development was the essence of all development	nental efforts
the physical and financial assets. These expenditures and the theme was 'Development of human'r	esource'. It is
includes the building construction, dams, Railways, inportant that India became a member of the	W.T.O. on 1 st
Industrial development etc. It is done irregularly. It is January 1995 during this plan.	
called the developmental expenditure. In the budget 56. Which of the following thinker i	is associated
divided into two astegories (1) Non planned conital with "the concept of political sover	eignty?
expenditure (2) Planned capital expenditure (a) MacIver (b) Socrate	es
(c) Rousseau (d) Plato	
52. Which economic activity cannot be included in Ans. (c) : Rousseau was a great philosophe	r and thinker,
(a) Working in a call centre	Rousseau is
(a) working in a can-echiece and a solution associated with the concept of political Bousseau says that "Man is been free and a	sovereignty"
(c) Bee keeping	s are (i) The
(d) Banking Social Contract 1762 (2) Dialogue (3) An In	troduction to
Ans (a): In accompany, the economic sectors has been Political Economy, 1758	
divided into three parts-	a good state
(1) Primary sector-These includes agriculture and a bad citizen makes a bad state	???
forestry animal husbandry fisheries Bee keeping (a) Plato (b) Aristot	le
mining and quarrying. (c) G. B. Shaw (d) Rousse	au
(2) Secondary sector-These includes industries like Ans. (b) : Aristotle's statement was that "A	good citizen
sugar, textiles etc. and the manufacturing. makes a good state and a bad citizen makes	a bad state."
(3) Tertiary sector-This is basically called the service It is important that Aristotle was a fa	mous Greek
sector. This includes mainly banking, insurance, Philosopher, a pupil of Plato and the teacher	of Alexander
transport, telecom, tuition occupation, working in the the great. Their greatest composition is Point	lics'. Aristotie
call centre etc. Hence the option (c) the Bee-keeping	al in India ia
tails under primary sector. 50. Panchayat Samiti at the block leve	ei in muia is
53. Which of the following statement is true for the (a) Advisory Body	
Public Sector Unit? (a) Authority only (b) Coordinating Authority only	
(a) Most of assets is owned by a group of people (b) Most of assets is owned by a group of people (c) Supervisory Authority only	
(d) Most of assets is owned by big companies (d) Administrative Authority	
(d) Most of assets is owned by government (d) Most of assets is owned by government	em has three
(d) Most of assets is owned by an individual [levels – Gram Panchayat at village leve	l, Panchayat
Ans. (c) : Public sector units includes all those Samiti at Block level and Zila Parishad at I industrial and commercial enterprises which is owned!	District level.
and managed by the government or by any other agency II The Panchayat Samiti at Block le	evel is an
assigned by the government Hence the assets of public light developmental works in their representation	inctioning of
sector units are mostly in government ownership. The function the works related to educat	ion health
public sector provides basic facilities like defence, agriculture and village industries	lon, nearm,
energy, iron and steel, coal, journey by air etc. It is	who decides
remarkable that Pandit Jawahar Lal Nehru named the	ent?
public sectors as the 'temples of modern India'.	cnt.
54. The percentage of India's population in the (b) Parliament	
total population of the world as per 2011 census (c) Supreme Court	
is:(d) President of India	
(a) 17.5% (b) 18.01% (b) 18.02% (c)	, of Indian
(c) 19.35% (d) 20.25% [Constitution the parliament will decide th	e salary and
Ans. (a) : According to the census of 2011 the total allowances of every members of parlia	ament. It is
population of India is 121.5 crore which is 17.5% of important that to be elected as a member of	of parliament
world's total population. In India, states with higher one must be – a citizen of India. For the me	embership of
population are – U.P., Maharashtra, Bihar, West Rajya Sabha age must not be less than 30	years and 25
Bengal, Andhra Pradesh.	

60. Which one of the following is not correctly matched? (a) Eighth Schedule: Languages	v act of 1919, (ii) Jaliyanwala bagh massacre in 13th April, 1919, (3) Sadler Commission in 1917 to enquire about Calcutta University.
(b) Second Schedule: Form of Oath of office	65. Who among the following was the founder of
(c) Fourth Schedule: Allocation of seats in Raiy	the Arva Mahila Samaj in the early 1880s?
Sabha	(a) Swami Dayananda Saraswati
(d) Tenth Schedule: Defection related provisions	(b) Swami Vivekananda
Ans. (b) :	(c) Ramabai Ranade
Schedule Related Subjects	(d) Pandita Ramabai
(1) 8 th Schedule – Languages	Ans (d) · Arva Mabila Samai was established by
(2) 2^{nd} Schedule – Provisions relating to	Pandita Ramabai in 1881 in Pune In 1889 Ramabai
President, Governor, Speaker	established Sharda Sadan for widows. Pandita Ramabai
and Deputy Speaker of Lok	was a famous social worker as well as a great scholar.
Sabha, Chairman and Deputy	She traslated Bible into Marathi.
Chairman of Rajya Sabha	66. Dasht-e Kavir Desert is located in which
high Court etc	country?
$(3) 4^{\text{th}}$ Schedule – Allocations of seat in the	(a) Iran (b) Saudi Arab
Raiva Sabha	(c) Iraq (d) Sudan
(4) 10 th Schedule – Anti-defection law.	Ans. (a) : Dasht-e Kavir and Dasht-e Lut both desert
Note – Form of Oaths or Affirmation has been	are situated in Iran. Iran is a country in west Asia. The
described in 3 rd Schedule.	highest peak of Iran is Mount Demavand which is
61. When did the Chinese traveler 'Sung Yun	situated in Elburz mountains. It is important that in Iran
come to India?	the major irrigation portion is covered by the Qanat
(a) 510 AD (b) 518 AD	canal which is made by under ground tunnels.
(c) 525 AD (d) 528 AD	67. Which of the following layers is called
Ans. (b) : Chinese traveler 'Sung Yun' came to India in	(a) Earth's most internal layer
518 A.D. and collects many Buddhist text during their	(a) Earth's intermediate layer
three year stay.	(b) Earth's tenmost lower
It is noted that Fa-hien, Hsuan Isang and I-tsing were	(c) Earth s tophiost layer (d) Lowest port of the atmosphere where elimete
other chinese traveler who visited India. Fa-nien came	(u) Lowest part of the atmosphere where chinate
A D) Hsuan Tsang came in the reign of Harshvardhan	Ang (a): On the basis of saismic wayes the earth's
in around 629 A.D.	laver has been divided into three parts-
62. Which among the following state 'Odantpuri	(i) Lithosphere – This is upper most part of earth's
education center was situated?	surface which is also called Sial. Its
(a) Bengal (b) Gujarat	thickness is observed of around
(c) Bihar (d) Tamil Nadu	100Km.
Ans. (c) : "Odantpuri" education center was situated in	(ii) Pyrosphere– This layer is also called the mag
Bihar. According to some scholar the famous Budhist	mosphere. It contains excess of
monastery of Odantpuri (Bihar) was built by Devapala	basalt. Its thickness is upto 2880 Km.
who was a follower of Buddhism. In texts he adorned of	(III) Barysphere I his is the innermost part of Earth's
(2) When we the found of Debugst Vise here?	Iron and Nickel occurs This is
63. Who was the founder of Bahmani Kingdom?	situated beyond 2880 Km
(a) Hasan Gangu (b) FIFOZ Shan (a) Mahmud Gawan (d) Asaf Khan	68 The Blue Nile river originates from which of
(c) Maining Gawan (u) Asar Khan	the following lakes?
kingdom had come into existence in 1347 the later	(a) Lake Victoria (b) Lake Tana
period of Muhammad Bin Tughlag by an Afghan	(c) Lake Edward (d) Lake Albert
adventurer Gangu who assumed the title of Alauddin	Ans. (b) : Lake Tana of Ethiopia, a country in African
Hasan Bahaman Shah. He made Gulburga the capital of	continent is the largest in the country. The Blue Nile
newly established empire and renamed it Ahsanabad -	river originates from it while the Nile river originates
Later in 1425 Bidar became its capital.	from Victoria lake, the largest lake in Africa continent.
64. During whose rule in India did the Khilafa	t Nile river is the longest in the world.
movement begin?	69. Which of the following states of India has the
(a) Lord Mountbatten (b) Lord Dalhousie	largest percentage of geographical area under
(c) Lord Chelmsford (d) Lord Curzon	forest as per the report of the Forest survey of
Ans. (c) : Khilafat and non-cooperation movement has	India?
started in the period of Lord Chelmsford (1916-21	(a) Manipur (b) Meghalaya
A.D.). The other events in this period are-(1) Rowlett	(c) Mizoram (d) Nagaland

Ans. (c) : India's forest survey report (IFSR) 2017 has a public set of the survey report (IFSR) 2017 has a public set of the survey (Japan) while in 2024 and 2028 will in Takyo (Japan) while in 2024 and 2028 will	ill be held
the state with highest percentage cover of forest are-II Paris (France) and Los Angles (USA) respectively	velv
Lakshadeep - 90.33%, Mizoram - 86.27%, Andaman & 75 Which country has won the 2017 h	Davis Cun
Nicobar Island - 81.73% Tennis Tournament?	butto cup
Note-According to options available in the question the (a) Switzerland (b) Serbia	
option (c) is correct. (d) Belarus	
70. At which of the following towns the Alaknanda and Ans. (c) : Davis Cup is the most reputed in	ternational
the Bhagirathi combines to form River Ganga? [team competition on Lawn Tennis in men's	group. In
(a) Haridwar (b) Risnikesh [2017, France wins the tournament by	defeating
(c) Rudiapiayag (d) Devplayag Belgium.	
Ans. (d) : Alaknanda and the Bhagirathi completes hear 76. "You are Unique" is written by	••••
river originates from the Gangotri glacier of Uttarakhand.	
Yamuna is the right tributaries of Ganga while the major	
left tributaries are-Ramganga, Gomti, Ghaghra, Gandak, (d) Arvind Adiga	
Kosi and Mahananda. It is important that the delta of	tten hy Dr
Ganga and Brahmaputra is the largest in the world.	uen by Di.
71. 'Nirvana Fund' was set up by NSDC for 77 The third Indian Council for	Cultural
(a) Entranceal neip to	Indologist
(a) Endepieneurs from the bottom rungs of Award for the year 2017 was av	warded to
(b) Displaced Kashmiri Pundits Japanese professor	
(c) Old age people having no means of livelihood (a) Hiroshi Marui (b) Shimama	ıru Marui
(d) Ventures of selected candidates trained under (c) Nagasaki Marui (d) Toyota M	Iarui
PMKVY but did not get any job Ans. (a) : The third Indian Council fo	r Cultural
Ans. (d) : 'Nirvana Fund' was set up by NSDC for Relations (ICCR) Distinguished Indologist	Award for
financial help to those unemployed candidate who is the year 2017 was awarded to Japanese	Indologist
selected and skilled under PMKVY (Pradhanmantri) working abroad who have made c	utstanding
Kaushal Vikas Yojna).	of India's
72. Nakul Swasthya Patra' is a scheme by the history, philosophy, thought, art, culture,	literature
Government for which among the following languages, civilization, society etc.	
78. Which of the following city has be	came first
(a) wellness of animal owners	d heritage
(c) Taking care of lactating mother in the rural (c) Joinur (b) Abmodel	ad
areas (a) Jaipui (b) Allahaha	d
(d) Taking care of newborn babies in the rural $Are (b) : In 41^{st}$ session of UNESCO's wor	u Id haritaga
areas areas summit on 8th of July 2017 Ahmadabad the	historical
Ans. (a) : 'Nakul Swasthya Patra' is an animal health city of Guiarat, got the world heritage city t	ag. This is
card scheme started by Animal and dairy board of the first city in India to have such title.	0
ministry of agriculture, Govt. of India. In this card the 79. In June 2017, which of the following	g countries
have signed a protocol of co-operat	ion in the
registered. field of archive?	
73. Which mine of India was in the news recently (a) India and Israel	
for becoming the country's first iron-ore mine (b) India and Portugal	
to have a solar plant for reducing carbon (c) India and Netherland	
footprint?	
(a) Talchar mine (b) Koraput mine (b) R (c) in June 2017 India and Portugal ha	as signed a
(c) Noamundi mine (d) Ratnagiri mine [protocol of co-operation in the field of archive	:do USD
Ans. (c): On 10 th July 2017 the Noamundi Mine of 318 million as line of credit for	develoning
one mine to have a solar plant Solar power plant of 3	following
MW has installed here which will reduce the carbon country ?	e
footprint of 3000 tons annually. (a) Bangladesh (b) Nepal	
74. Where will the Summer Olympics be held in (c) China (d) Sri Lanka	a
2028? Ans. (d) : India has signed an agreement with	Sri Lanka
(a) Sydney (b) Paris to provide USD 318 million as line of	credit for

81. Dot Matrix is a type of	Ans. (c) : Mass of a hydrogen atom is 1837 times mass
(a) Tape (b) Disk	of an electron. It is important that hydrogen is a gaseous
(c) Printer (d) Bus	non metal whose atomic number is 1 and atomic weight
Ans. (c) : Printer is an output device that receives	table. It contains only one proton in their nucleus and an
information from computer and print on paper. This	electron revolving outside of nucleolus. It is the only
Matrix is a type of printer it is an impact printer so it	element with zero neutron. It is most available element
makes noise while printing. This printer has a matrix of	in the universe.
multiple pins in the print hand and all dot matrix	87. Which of the following are Fabrics that may
printers create characters on paper by striking an inked	contain polyester?
ribbon with a hard surface.	I. Polycot
82. The secondary storage devices can only store	II. Polywool
(a) Arithmetic operations	(a) Only Land II (b) Only Land III
(a) Antimetic operations (b) Logic operations	(a) Only I and II (b) Only I and III (c) Only II and III (d) All I II and III
(c) Fetch operations	Ans (d) · Polyester is a polymerised synthetic fiber. In
(d) All options are correct	order to synthesis the polyester hydroxyl (–OH) groups
Ans. (d) : The secondary storage devices are also called	carbonous compound chemically react with two
Auxiliary storage devices. This is not a part of	carboxylic (-COOH) groups and ester group (-COO) is
computer. It is connected to the computer separately.	formed. Since in this fiber there are so many ester
These devices can store data only, arithmetical, logical	of cloths in making housenines of fire extinguishers
and fetching operations can't be done by this.	Polycot, polywood and Terrycot clothe can have
83. In the modern periodic table metals, metalloids and non metals are found in which block?	polyester.
(a) s-Block (b) n-block	88. Which of the following term does NOT
(c) d-block (d) f-block	represent electrical power in circuit?
Ans. (b) : On the basis of valancy electrons in modern	(a) I^2R (b) IR^2
periodic table the elements are divided into four blocks-	$(c) VI \qquad (d) V^2/R$
s,p,d,f. s-block contains the elements of group 1 & 2. p-	Ans. (b) : Electrical circuit is a combination of various
block contains elements of group 13 to 18 i.e. metal,	lenergy generated by the blowing of current can be used
group 3 to 12 and f-block contains lanthanides and	for various purposes.
actinides elements.	As we know that $-P = VI$ (1)
84. Cinnabar is ore of which of the following?	where
(a) Magnesium (b) Aluminium	I = current, $R = Resistance$, $V = Potential$
(c) Mercury (d) Iron	P = Electrical power
Ans. (c) : Mercury is a chemical element with symbol	but according to ohm's law $- V = IR$ (2)
Hg and atomic number 80. It is also called quick silver.	By putting the value of equation. (2) in equation (1)
It is very rare element in nature and found in independent state. Its main are is Cinnabar. It is white in	$\left \left \right _{\mathbf{p}} - \mathbf{V}^2 \right $
colour and very bright metal which is found in liquid	$\left \right ^{r} = \frac{1}{R}$
state at room temperature. Like other metals it is neither	$\therefore \mathbf{P} = \mathbf{I}^2 \mathbf{R} \dots \dots$
malleable nor ductile. At 4.12k temperature its	then by putting value of equ. (2) in equation (3)
resistance becomes zero.	
85. In which of the following mirror size of image	$I = \frac{1}{R} - \dots + (4)$
formed is always equal to the size of object?	
(b) Concave mirror	then equ. $\Rightarrow P = \frac{V}{V}$
(c) Plane mirror	\mathbb{R}
(d) Both convex and concave mirror	while option (b) IR ² is not correct.
Ans. (c) : Plane mirror is made polishing the surface of	89. A positively charged particle projected towards
a glass of uniform thickness with a bright metal like	west is deflected towards north by a magnetic field What is the direction of magnetic field?
mercury and silver on one side. This process is called	(a) toward south (b) toward east
silvering. After this a layer of silver nitrate is applied	(c) downward (d) upward
image in the plane mirror is always equal to the size of	Ans. (d) : The region or space around a magnet through
the object. The plane mirror is utilised in the form of	which any other magnet or magnetic material
looking glass, Kaleidoscope and Periscope.	experience force of attraction or repulsion is called
86. Mass of a hydrogen atom is how many time the	magnetic field. SI unit of magnetic field is Tesla (T). A
mass of an electron?	positively charged particle projected towards west is deflected towards north by a magnetic field then
(a) 1000 (b) 8000	direction of magnetic field will be unward
(c) 1837 (d) 5000	and the magnetic field will be up wild.

90. Which of the following is NOT positively | Ans. (c) : The causes of Hypermetropia arecharged? (i) The sphericity of the eye lens is decreased. (a) Alpha particle (b) Proton (ii) The focal length of the lens increases. (c) Helium nucleus (d) Electron (iii) Due to this the distance between eve lens and Ans. (d): Electron was invented by J.J. Thomson. It is retina decreases that means the diameter of the a negatively charged particle which rotates in various eyeball is reduced. orbits around the nucleus. The charge of an electron is -The person suffering from hypermetropia can't see the 1.6×10^{-19} C. This is a stable fundamental particle. near most objects but can see the objects located at While alpha particle, proton and Helium are positively remote distances. charged. 96. Antibiotics are useful for which type of infections? Which is a water soluble Vitamin? 91. (a) Only bacteria (b) Only virus (a) Vitamin A (b) Vitamin C (c) Vitamin D (d) Vitamin K (c) Both bacteria and virus Ans. (b) : Vitamin–B and Vitamin–C are soluble in (d) Neither bacteria nor virus water while Vitamin – A, D, E, K are soluble in fat. It is important that Vitamin–C (Ascorbic acid) was first Ans. (a) : Antibiotics are also known as antimicrobial drugs. Antibiotics are used to treat or prevent infections discovered. The deficiency of Vitamin-C causes scurvy caused by bacteria, fungi and protozoa. These disease. The main sources of Vitamin-C are citrus medicines treat infections either by killing or decreasing the growth of bacteria. Naturally it is produced by some fruits like – lemon, orange, Indian gross berry etc. microorganism or artificially in the laboratory. It is 92. Match the items given in column (A) with those important that penicillin, an antibiotic produced by the in column (B). fungus, was discovered by Alexander Fleming. Column-A Column-B 97 Which one of the following is NOT responsible I. Frog 1. Skin for water shortage? II. Leaves 2. Stomata (a) Rapid growth of industries III. Earthworm 3. Lungs and skin (b) Increasing population (a) I-3, II-2, III-1 (b) I-1, II-2, III-3 (c) Forestation (c) I-3, II-1, III-2 (d) I-2, II-1, III-3 (d) Mismanagement of water resources Ans. (a) : Frogs respire through their lungs and skin. In Ans. (c): When in a certain period the demand of water the plants, the stomata's present in the leaves are exceeds to their availability or the use of water is responsible for the respiration while earthworm respires interrupted due to poor quality then this situation through their skin because it lacks lungs. represents the scarcity of water. The reason behind this Hence option (a) is correct. industrialisation, growing is-rapid population, How many number of chambers are there in 93. mismanagement of water resources. human heart? 98. Which gas is major contributor to greenhouse (a) Two (b) Three effect? (c) Four (d) Five (a) Carbon dioxide (b) Chlorofluorocarbon Ans. (c) : There are four chambers in the human heart. (c) Sulphur dioxide (d) Nitrogen dioxide Which are divided by septum to each other. The two Ans. (a) : The major responsible gases for green house upper chambers are small and thin called Auricle. The effects are - carbon dioxide (CO2), chlorofluorocarbon two lower chambers are called ventricle which are also (CFC), Methane (CH_4), Nitrous oxide etc. These gases of two types right ventricle and left ventricle. There is a stops heat escaping from the earth into space which hole between every auricle and their respective below results in the increase of average temperature of ventricle which is called Atrio-ventricle valve. These atmosphere. Carbon dioxide has highest contribution in valve open towards ventricle only. green house effect. Which of the following is NOT present in a 94. 99. Which of the following is NOT a major matured stomata? problem in development of resources? (a) Plasmodesma (b) Chloroplast (a) Depletion of resources for satisfying the (c) Cell wall (d) Vacuole greed of few individuals. (b) Accumulation of resources in few hands. Ans. (a) : Stomata is a hole found mainly in the epidermis of leaves. In matured stomata chloroplast, (c) An equitable distribution of resources. cell wall and vacuole are presents. The main function of (d) Indiscriminate exploitation of resources. stomata is to absorb carbon dioxide from the Ans. (c) : A resource is defined as a service or other asset environment and to release oxygen that means the used to produce goods and service of or have technology exchanges of gases. (Photosynthesis). to produce that meet human needs and wants, and which is economically feasible and culturally valid. The main 95. What is/are the cause(s) of arise hypermetropia? problems in development of resources are-(a) Excessive curvature of the eye lens. (i) Degradation of resources by some greedy people (b) Elongation of the eye ball. (ii) Centralisation of resources to limited hands. (c) Focal length of the eye lens is too long. (iii) Over exploitation of resources. (d) No option is correct.

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$$\begin{vmatrix} \text{Senser force (F)} \\ F_{xx} = \frac{1}{2} \frac{W \cdot x}{\ell} \times x \\ \text{So, shear force at point-B} \\ \text{At } (x = 0), \frac{F_{xx}}{F_{x}} = \frac{0}{2} \\ \hline \\ \text{Senser force at point-B} \\ \text{At } (x = 0), \frac{F_{xx}}{F_{x}} = \frac{W^{2}}{2} \\ \text{Bending Moment-Taking moment about section xx} \\ \text{from free end} \\ = -\frac{Wx}{\delta} \\ = -\frac{Wx}{\delta} \\ \hline \\ \frac{K}{\delta} \\ = -\frac{Wx^{2}}{\delta} \\ \hline \\ \text{Bending moment about point B} \\ \text{At } x = \ell \\ \frac{M_{xx} = \ell}{M_{x}^{2}} \\ \frac{W^{2}}{2} \\ \text{Are } 0, M_{n} = 0 \\ \text{BM. about point A} \\ \text{At } x = \ell \\ \frac{M_{xx}}{M_{n}} = -\frac{W\ell^{2}}{M_{n}} \\ \hline \\ \text{At } x = \ell \\ \frac{M_{xx}}{M_{n}} = -\frac{W\ell^{2}}{M_{n}} \\ \hline \\ \text{Co } 25 \text{ MPa} \\ \hline \\ \text{13. Maturel total of 1 Ib N. Th testisterst diveloped is when does of instruction for the point and the system is in equilibrium with the system is inclusted base has the least entropy because in solids, has an observed when the system is in equilibrium with the system is inclusted base of the least entropy because in solids has the arrangement of molecules of its structure has an ordered distribution. The system it is system iterversible processes. Surper solids up on the appendixt of the system iterversible processes. Horepy of the system iterversible process entropy of the system iterversible process interversible the entropy because of randomness increases strupy of the system iterversible process entropy of the system iterversible process entropy of the system iterversible process entropy will decrease the system iterversible the cart entropy will decrease the fast is removed $\rightarrow ds < 0$, entropy will itervas and the end is $ds = \frac{1}{16} + \frac{d^{2}}{64}$ (b) $J = \frac{\pi}{16} d^{4}$ (c) $J = \frac{\pi}{16} d^{4}$ (d) $J = \frac{\pi}{16} d^{4}$ (d) $J = \frac{\pi}{16} d^{4}$ (for the core system iterversible process entropy of a system may increase, my decrease or remain same. Here for a reversible process entropy of a system may increase. My decrease$$







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Copper $1084^{\circ}C$ Wraught Iron $1218-1593^{\circ}C$ Grav cast Iron $1127-1204^{\circ}C$	159. is the hardest known material. (a) Cemented carbide (b) Ceramic (c) Diamond (d) Alloy steel
Low carbon steel $1426-1538^{\circ}C$	Ans : (c) Diamond– Diamond is a solid form of the
Cast iron 1482–1593°C 156. is commonly used for making household utensils. (a) Duralumin (b) Hindalium (c) γ-alloy (d) Magnalium	element carbon with its atoms arranged in a crystal structure called diamond cubic. At room temperature and pressure, another solid form of carbon known as graphite is the chemically stable form, but diamond almost never convert to it. Diamond has the highest hardness and thermal conductivity of any natural
aluminium, magnesium, manganese, chromium and silicon etc.	as cutting and polishing tools.
 Hindalium making hausehold utensils. Maching and walding is good at hindalium 	160is obtained by isothermal hardening
 Hindalium does not chemical reaction with food 	operation. (a) Cementite (b) Sorbite
materials.	(c) Acicular troostite (d) Bainite
Application of duralumin- Automobile and aircraft parts.	Ans : (d) Bainite is formed by austempering, which is
Y-alloy- Air crafts engine parts	isothermal hardening method. Austenite is cooled at the
Magnalium– Air craft and automobile components.	temperature below the nose is TTT- diagram but above
157. Ball bearing are generally made up of	Martensite start line. The temperature of sample is
(c) stainless steel (d) grey cast iron	curve enters into the TTT diagram, this produces Bainite
Ans : (b) Ball bearing are generally made up of carbon	micro structure.
chrome steel. The chemical composition of this steel has high carbon and about 1.5% chromium content	161. Fluid is substance which offers no resistance to change of
Using controlled processing and heat beating methods	(a) pressure (b) flow
the finished bearing components here high strength to	(c) shape (d) volume
Gray cast Iron – Cast iron which during solidification it	Ans : (c) Fluid is a substance that continuously deforms under an applied shear stress so fluid cannot
contains graphite flakes, causing low strength and poor	resist any shear force applied to it.
Greav Cast Iron Engine block engine cylinder	All liquid, gas and vapor are fluid.
piston rollers machine base frame, flywheel etc.	162. Density of water is maximum at (a) $0^{0}C$ (b) $0^{0}K$
Stainless steel A group of ferrous alloys that contain at least 11% Cr. providing extraordinary corrosion registance	$\begin{array}{cccc} (a) & 0 & C & (b) & 0 & K \\ (c) & 4^{0}C & (d) & 100^{0}C \\ \end{array}$
Uses of –	Ans : (c) Water density is maximum at 4° C
Stainless Steel– Domestic, medical tools knife,	density = $\frac{\text{mass}}{\text{mass}} \Rightarrow \text{density} \propto \frac{1}{1}$
scissors, bearing, spindle etc.	volume volume
(a) Lead (b) Aluminium	 Pure water is colorless,
(c) Brass (d) Silver	 Density of water 1000 kg/m³
Ans : (c) Brass – Brass is an alloy of copper and zinc in proportions which can be varied to achieve varying mechanical and electrical properties	 Boiling and freezing point at atmosphere pressure 100°C and 0°C. Coefficient of expansion – neglected (very less)
Brass has higher malleability than bronze or zinc. The	163. A perfect gas
relatively low melting point of brass (900 to 940°C)	(a) has constant viscosity
make it a relatively easy material to cost.	(b) has zero viscosity
Silver – Silver is an extremely soft, ductile and malleable	(d) None of these
metal, though its slightly less malleable than gold. A soft, white lustrous it exhibits the highest electrical conductivity	Ans : (d) Perfect gas- A hypothetical gas which obeys
thermal conductivity and reflectivity of any metal. Its used	the low $PV = mRT$ at all pressure and temperature is
to cooking and jwellery etc.	164. A fluid in equilibrium can't sustain
ability to resist corrosion through the phenomenon of	(a) tensile stress (b) compressive stress
passivation. Alluminium and its alloys are vital to the	(c) shear stress (d) bending stress
aerospace industry and important in transportation and building industries, such as building facedes and window frames.	Ans : (*) A Fluid is a substance that is having the ability to flow or deform continuously under the action of shear force.
Alluminium is most widely used non-ferrous metal.	• For a static fluid shear stress is zero



171. The magnitude of rise of pressure due to water hammer in a rigid and non-elastic pipe carrying water of density ρ and bulk modules (k) will be equal to

(a)	$\frac{k}{\sqrt{p}}$	(b)	$\sqrt{k\rho}$
(c)	$\sqrt{\frac{\rho}{k}}$	(d)	$\frac{\mathbf{k}}{\mathbf{\rho}}$
(a)	A only	(b)	B only
(c)	C only	(d)	D only

Ans: (b) Water hammer in pipes– In a long pipe, when the flowing water is suddenly brought to rest closing the valve or by any similar cause, there will be sudden rise in pressure due to momentum water being destroyed. A pressure wave is transmitted along the pipe. A sudden rise in pressure has the effect of hammering action on the walls of the pipe. This phenomenon of sudden rise in pressure is known as water hammer.

- The magnitude of pressure rise depend on-
- (i) The speed at which valve is closed
- (ii) The velocity of flow
- (iii) The length of pipe
- (iv) The elastic properties of the pipe material as well as mass of the flowing fluid.

Equating the loss of K.E. to the gain of strain energy, we get

Rise of pressure due to water hammer in rigid and nonelastic pipe.

 $=V_0\sqrt{K\rho}$

172. The flow of any fluid, real or ideal, must fulfill the following.

- (a) Newton's law of viscosity
- (b) Newton's second law of viscosity
- (c) Velocity at boundary must be zero relative to the boundary

(d) the continuity equation

Ans : (d) The flow of any fluid, real, ideal must fulfill by the continuity equation. In case of incompressible fluid, one dimension and continuity equation is $\boxed{A_1V_1 = A_2V_2}$

$$P_1 = P_2 =$$
 Incompressible fluid

- 173. The most economical section of circular channel for maximum discharge is obtained when (where, d is the diameter of circular section)

 (a) depth of water = 0.95d
 (b) water perimeter = 2.6 d
 - (b) water perimeter = 2.6 d
 - (c) hydraulic mean depth = 0.29 d

(d) Any one of these

Ans: (d) In circular channel, condition of maximum discharge
Depth of water = 0.95 d

- Water perimeter = 2.6 d
- Hydraulic mean depth = 0.29 d
- (where, d is the diameter of circular section)For maximum discharge, the depth of flow in circular channel is 0.95 d.

I. Borda's mouthpiece is

- (a) a short cylindrical tube projecting inward, having length of 1/2 diameter
- (b) a convergent tube having length of 2–3 diameters
- (c) most commonly used
- (d) rarely used

Ans : (a) Borda's mouthpiece– Borda's mouthpiece is also called internal mouthpiece or re-entrant.

An Borda's mouthpiece is short cylinder tube attached to an orifice in such a way that it (tube) projects inwardly to a tank. If the length of the tube is equal to diameter, the jet of liquid comes of the tube, the mouthpiece is known as running free. But if the length of the tube is about 3 times its diameter, the jet comes out its diameter equal to the diameter of mouthpiece at the outlet, the mouthpiece is said to be running fall.

Co-efficient of contraction, when consider a mouthpiece running free.
 C_c = 0.5

 $C_c = 0.$

- Co-efficient of velocity C_v = 1.0
 Co-efficient of discharge C_d = 0.5
- Consider a mouthpiece running full

Co-efficient of velocity
$$C_v = \frac{1}{\sqrt{2}}$$

Co-efficient of contraction $C_c = 1$

Co-efficient of discharge $C_d = C_c \times C_v = 1 \times \frac{1}{\sqrt{2}} = 0.707$

175. The critical velocity as

- (a) maximum attainable velocity
- (b) terminal velocity
- (c) velocity when hydraulic jump occurs
- (d) velocity above which the flow ceases to be streamlined

Ans : (d) The critical velocity as velocity above which the flow ceases to be streamlined.

- Critical velocity is two type
- (i) Lower critical velocity
- (ii) Higher critical velocity
- Critical velocity is inversely proportional to temperature of water.
- 176. Reynolds number for non-circular cross section is :
 - [V = mean velocity
 - *v* = kinematic viscosity
 - P= Ratio of cross section area to the water perimeter]

(a)
$$\frac{V.4P}{v}$$
 (b) $\frac{V.P}{v}$
(c) $\frac{V.2P}{4v}$ (d) $\frac{V.P}{4v}$
(a) A only (b) B only
(c) C only (d) D only

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Ans : (a) Reynolds number for non-circular cross	(a) $h_1 - h_2$ (b) $\sqrt{h_1 - h_2}$
section $=\frac{V.4P}{V.4P}$	(c) $\sqrt{h_1} = \sqrt{h_2}$ (d) $h_1^{3/2} = h_2^{3/2}$
ν	(c) $\sqrt{n_1}$ $\sqrt{n_2}$ (d) n_1 n_2 (a) A apply (b) B apply
where $V =$ mean velocity	$\begin{array}{ccc} (a) & A & \text{only} \\ (c) & C & \text{only} \\ (c) & C & \text{only} \\ (d) & D & \text{only}$
v = kinematic viscosity	Ans: (c) One tank in which water level is h. and
P = Ratio of cross-section area to the water	another tank having level is h_2
perimeter	$\frac{1}{2} \sum_{i=1}^{n} \frac{1}{2} \sum_{i=1}^{n} \frac{1}$
177. In case of two dimensional flow the	Time of flow = $\frac{2A(\sqrt{n_1} - \sqrt{n_2})}{\sqrt{n_1}}$
by the streamlines will consist of a series of	$c_d \cdot a \cdot \sqrt{2g}$
(a) circular arcs (b) parabolic arcs	■ Time of flow is directly proportional to
(c) hyperbolic arcs (d) elliptical arcs	$\left(\sqrt{h_1} - \sqrt{h_2}\right)$
Ans : (c) In case of two dimensional flow the	
components of velocity are given by $u = ax$, $v = by$, the	180. Which of the following represents steady
streamlines will consist of a series of hyperbolic arcs.	(a) flow through an expanding tube at an
Stream line equation	increasing rate
$\frac{\mathrm{dx}}{\mathrm{dx}} = \frac{\mathrm{dy}}{\mathrm{dx}}$	(b) flow through an expanding tube at constant
u v	rate
here $u = ax$, and $v = by$ (given)	(c) flow through a long pipe at decreasing rate
$\frac{dx}{dt} = \frac{dy}{dt}$	(d) flow through a long pipe at constant rate
ax by	Ans : (d) Flow through a long pipe at constant rate
$\frac{1}{1} \frac{dx}{dx} = \frac{1}{1} \frac{dy}{dy}$	represents steady uniform flow. Constant rate means
a x b y	steady flow long pipe having uniform cross section area
Integrating both side	Steady flow . The type of flow in which the fluid
$\frac{1}{2} \ln x = \frac{1}{2} \ln x + c$	characteristics like velocity, pressure, density etc at a
$\frac{-c_{\text{IIX}}}{a} = \frac{-c_{\text{IIX}}}{b} + c_{\text{IIX}}$	point do not change with time is called steady flow.
$b\ell nx = a\ell ny + abc$	$(\partial \mathbf{u})$ $(\partial \mathbf{v})$ $(\partial \mathbf{w})$ $(\partial \mathbf{w})$
$\ell n x^b = \ell n y^a + a b c$	$\left\ \left(\frac{\partial t}{\partial t} \right)_{x_0, y_0, z_0} = 0 \left(\frac{\partial t}{\partial t} \right)_{x_0, y_0, z_0} = 0, \left(\frac{\partial t}{\partial t} \right)_{x_0, y_0, z_0} = 0$
x ^b	$\left(\partial P \right) = 0 \left(\partial \rho \right) = 0$
$\ln \frac{\pi}{v^a} = abc$	$\left\ \left(\frac{\partial t}{\partial t}\right)_{X_0, Y_0, Z_0} = 0, \left(\frac{\partial t}{\partial t}\right)_{X_0, Y_0, Z_0} = 0$
h	Where (x_0, y_0, z_0) is a fixed point yield where these
$\frac{X^{\circ}}{a} = e^{abc} \qquad \qquad$	variables are being measured w.r.t. time
y ^a	Uniform flow- The type of flow, in which the velocity
$x^{b}v^{-a} = c_{1}$ Hyperbolic Arc	at any given time does not change with respect to space
	is called uniform flow.
1/8. Friction factor of pipes depends on	$\left(\frac{\partial V}{\partial x}\right) = 0$
(a) fate of flow (b) fluid defisity (c) viscosity (d) all options are correct	$\left(\partial \mathbf{S}\right)_{t=constant}$
Ans : (d) Eriction factor of nines depends on	where $\partial V =$ change in velocity
(1) Rate of flow	$\partial S = displacement$
(2) Fluid density	181. Chezy's equation is used to determine
(3) Viscosity	(a) velocity of flow in open channel
Existing fraction from large $\mathbf{G}_{\text{exist}}$ (c) 64	(b) velocity of flow in pipe
Friction factor for laminar flow $(f) = \frac{1}{R_e}$	(c) flow over weirs (d) discharge through notch
Friction factor for turbulent flow smooth pipe	(d) discharge through hoten
(c) 0.36	of flow in open channel
$(t) = \frac{(R)^{1/4}}{(R)^{1/4}}$	Formula of flow in open channel
	Chezy's formula,
179. Time of flow from one tank in which water	Discharge (O) = $AC\sqrt{mi}$
1_{1} to another tank having level n_2 will be proportional to	where $A = cross section area of flow in channel$

УСТ





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194. Cochran boiler is a	(b) volumetric efficiency
(a) horizontal fire-tube boiler	(c) ignition time
(b) horizontal water-tube boiler	(d) effective compression ratio
(c) vertical water-tube boiler	Ans : (d) The accumulation of carbon in a cylinder
(d) vertical fire tube boiler	results in increase of effective compression ratio.
Ans : (d) Cochran boiler is a vertical fire tube boiler. Its diameter is 2.5 to 2.75 m	198. Which of the following is a false statement?
 In Cochran boiler produced steam pressure is 15 bar 	objectionable because it may cause the
 In Cochran boiler, diameter of fire tube is 62.5 mm 	following?
 In Cochran boiler, diameter of fire tube is 0.25 fire In Cochran boiler number of fire tube is 165 fire 	(a) piston ring and cylinder wear
tube boiler.	(b) formation of hard coating on piston skirts
Fire tube boiler Water-tube boiler	(c) oil sludge in the engine crank case
Locomotive boiler Wilcox boiler	(d) detonation
Cochran boiler Stirling boiler	Ans : (d) Detonation – Excess of sulphur in diesel fuel
Cornish boiler Benson boiler	are objectionable as it makes strong acid (sulphuric
Lancashire boiler Yarrow boiler	acid) which may cause piston ring wear and cylinder
Scotch marine boiler La-mont boiler	wear. It may cause the formation of hand coating on
195. The diameter of tubes for natural circulation	piston skirts and oil sludge in the engine carnk case.
boiler as compared to controlled circulation	• Higher the cetane number better will be the quality
boilers is	of diesel fuel, knocking will be less.
(a) more	199. Installation of supercharger on a four-stroke
(b) less	cycle diesel engine can result in the following
(c) same	percentage increase in power
(d) could be more or less depending on other	(a) upto 25%
factors	(b) upto 35%
Ans : (a) In natural circulation boiler, water circulation	(c) upto 50%
controlled by natural convection. But boiler circulation	(d) none of these
increased after use of cross tube. Eg. Lancashire,	Ans : (d) Installation of super charger on a four stroke
Cochran, Rail engine boiler	cycle diesle engine percentage increase in power more
• The diameter of tube for natural circulation boiler as	than 50% and upto 100%. In I.C. engine needs super
compared to controlled circulation boiler is more.	 Super chargers are installed in aircraft before the
196. Supercharging is the process of	- Super chargers are instance in anciant before the
(a) supply the intake of an engine with air at a	is converted into normal density as (like as level)
density greater than the density of the	then the rich AFM on carburetor is transformed into
(b) providing forced excline air	normal AFM.
(b) providing forced cooling an	200. In order to prevent formation of carbon on the
(d) supplying compressed air to remove	injector, the temperature (in ⁰ C) of nozzel tip
(d) supprying compressed an to remove	should be
Ans \cdot (a) Supplying the intake of an engine with air at a	(a) less than 100
Ans. (a) Supprying the make of an engine with an at a density greater than the density of the surrounding	(b) between 100-250
atmosphere. Density of air decreased with increased	(c) between 250-300
alitude.	(d) between 400-500
197. The accumulation of carbon in a cylinder	Ans : (c) In order to prevent formation of Corbon on
results in increase of	the injector, the temperature (in °C) of nozzle tip
(a) clearance volume	should be between $(250 - 300^{\circ}C)$.

SSC Junior Engineer Mechanical Online Exam 2018 CPWD/CWC/MES

Mechanical Engineering

Time : 03.15 pm]

[Exam Date : 22 January, 2018



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	(c) Just as	14. In the following question, select the odd letters
	$(12 \times 5) - 10, \implies 60 - 10 = 50$	from the given alternatives.
Simil	arly	$\begin{array}{ccc} (a) & LO & (b) & HS \\ (a) & IP & (d) & CV \end{array}$
	$(18 \times 5) - 10, \implies 90 - 10 = 80$	(c) IK (d) $CIAns (d) The letters I O SH and RL are reversed to$
8.	In the following question, select the related	each other, whereas CY is not reverse letter to each
	number from the given alternatives.	other.
	11 : 121 :: 15 : ?	15. In the following question, select the odd letters
	(a) 289 (b) 343	from the given alternatives.
<u> </u>	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	(a) XSNI (b) OJEY
Ans :	(c) Just as $(11)^2 = 121$	(c) UPKF (d) EZUP
	$Similarly (15)^{-} = 225$	Ans: (b) 24 10 14 0 15 10 5/21 25
9.	In the following question, select the related	X S N I O I F Y
	number from the given alternatives.	
	$\begin{array}{c} 49:30::81:1\\ (a) 92 \\ (b) 88 \\ \end{array}$	
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
Ang	(c) 70 (d) 64	21 16 11 6 5 26 21 16
Alls .	Similarly $81 + 7 = 88$	UPKF EZUP
	$\frac{1}{2} = \frac{1}{2} = \frac{1}$	
	So $? \Rightarrow 88$	-5 -5 -5 -5 -5
10.	In the following question, select the odd word	So, OJEY are different from the given alternatives.
	from the given alternatives.	16. In the following question, select the odd
	(a) Hand (b) Legs	number from the given alternatives.
<u> </u>	(c) Lungs (d) Ear	(a) $10 - 101$ (b) $12 - 145$
Ans :	(c) The hand, legs, Ear the external parts of body	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
where is dif	e as the lungs is the internal part of body. So, lungs	Ans : (d) $(10)^2 + 1 \implies 100 + 1 = 101$
15 uii	In the following question select the add word	$(12)^2 + 1 \implies 144 + 1 = 145$ $(24)^2 + 1 \implies 57(-1) = 577$
11.	from the given alternatives	$(24) + 1 \implies 5/6 + 1 = 5/7$ $(26)^2 + 1 \implies 676 + 1 + 675$
	(a) Lizard (b) Rabbit	$(20) + 1 \rightarrow 0/0 + 1 \neq 0/3$ So 675 are different from the given alternatives
	(c) Snake (d) Crocodile	17 In the following question select the odd
Ans	: (b) The lizard, snake and crocodile are the	number from the given alternatives.
reptil	es where as rabbit are the mammals. So, rabbit is	(a) 23 (b) 37
the of	dd word from given alternatives.	(c) 41 (d) 51
4.0	In the following question colort the odd word	
12.	In the following question, select the odd word	Ans : (d) The number 23, 37 and 41 are indivisible
12.	from the given alternatives.	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd
12.	from the given alternatives. (a) Car (b) Bus	Ans: (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives.
12.	from the given alternatives.(a) Car(b) Bus(c) Truck(d) Transport	 Ans: (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. 18. In the following question, select the odd number from the given alternatives.
I2.	in the following question, select the odd word from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the grad from the select the odd word from the select the select the odd word from the select the odd word from the select the selec	 Ans: (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. 18. In the following question, select the odd number from the given alternatives. (a) 11-26 (b) 16-33
Ans transp	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the optration. So, transport is the odd word from the alternatives	 Ans: (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. 18. In the following question, select the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33
Ans transp given	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives.	 Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. 18. In the following question, select the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33
Ans transp given 13.	in the following question, select the odd word from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives.	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives.18. In the following question, select the odd number from the given alternatives.(a) 11 - 26(b) 16 - 33(c) 13 - 28(d) 18 - 33Ans : (b)11 - 2616 - 33
Anstranspgiven13.	in the following question, select the odd word from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives.18. In the following question, select the odd number from the given alternatives. (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ Ans : (b) (a)11 - 26 (b)16 - 33 (c)(a)11 - 26 16 - 33
Ans transp given 13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the obtation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. 18. In the following question, select the odd number from the given alternatives. (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ Ans : (b) $16 - 33$ (a) $11 - 26$ (b) $16 - 33$ (b) $11 - 33$ (c) $14 - 33$ (d) $18 - 33$
Ans transp given 13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. 18. In the following question, select the odd number from the given alternatives. (a) $11-26$ (b) $16-33$ (c) $13-28$ (d) $18-33$ Ans : (b) (a) $11-26$ (b) $16-33$ (c) $13-28$ (d) $18-33$ (a) $11-26$ (b) $16-33$ (b) $11-26$ (c) $16-33$ (c) $13-28$ (c) $16-33$ (c) $13-28$ (c) $16-33$ (c) $13-128$ (c) $16-33$ (c) $11-26$ (c) $18-33$
Anstranspgiven13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the optration. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (c) GDZ (d) 9 6 3	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) 11 - 26 (b) 16 - 33 (a) $11 - 26$ (b) $16 - 33$ (b) $11 - 33$ Ans : (b) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) 16 - 33 (a) 11 - 26 (b) 16 - 33 (b) 16 - 33 (c) 13 - 28 (c) 16 - 33 (c) 16 - 33 (c) 17 - 26 (c) 16 - 33 (c) 18 - 33 (c)
Ans transi given 13.	in the following question, select the odd word from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the obtained. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (c) GDZ I F C (c) L I F	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ (a) $11 - 26$ (b) $16 - 33$ (b) $11 - 26$ (c) $16 - 33$ (c) $13 - 28$ (c) $16 - 33$ (d) $18 - 33$ (e) $13 - 28$ (f) $18 - 33$ (f) $13 - 28$ (f) $18 - 33$ (g) $13 - 28$ (g) $18 - 33$ (h) $13 - 32$ (h) $13 - 32$
Ans transpigiven 13.	in the following question, select the odd word from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport : (d) Car, Bus and Truck are all come under the obtation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ 9 6 3 1 F C (b) LIF (c) SPM (d) GDZ	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ (a) $11 - 26$ (b) $16 - 33$ (b) $11 - 26$ (c) $16 - 33$ (c) $13 - 28$ (c) $16 - 33$ (d) $18 - 33$ (e) $13 - 28$ (f) $18 - 33$ (f) $13 - 28$ (f) $18 - 33$ (g) $13 - 28$ (g) $18 - 33$ (h) $13 - 32$ (h)
I2. Ans transpigiven 13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ (d) $\begin{array}{c} 12 & 9 & 6\\ 1 & F & C\\ -3 & -3\end{array}$ (b) $\begin{array}{c} 12 & 9 & 6\\ L & I & F\\ -3 & -3\end{array}$	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ (a) $13 - 28$ (d) $18 - 33$ (b) $13 - 33$ (c) $13 - 28$ (d) $18 - 33$ (d) $13 - 33$ (e) $13 - 28$ (d) $18 - 33$ (f) $13 - 28$ (f) $18 - 33$ (g) $13 - 28$ (g) $18 - 33$ (h) $13 - 3$
I2. Ans transpigiven 13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ (d) $\begin{array}{c} 12 & 9 & 6\\ 1 & F & C\\ -3 & -3 \end{array}$ (b) $\begin{array}{c} 12 & 9 & 6\\ L & I & F\\ -3 & -3 \end{array}$	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ (a) $13 - 28$ (d) $18 - 33$ (b) $13 - 33$ (c) $13 - 28$ (d) $18 - 33$ (c) $13 - 28$ (d) $18 - 33$ (d) $18 - 33$ (e) $13 - 28$ (f) $18 - 33$ (f) $13 - 28$ (f) $18 - 33$ (g) $13 - 28$ (g) $18 - 33$ (h) $13 - 28$ (h) $13 - 33$ (h) $13 - 28$ (h) $13 - 33$ (h) $13 - 28$ (h) $13 - 33$ (h) $13 - 28$ (h) $13 -$
Ans transigiven 13.	In the following question, select the odd wordfrom the given alternatives.(a) Car(b) Bus(c) Truck(d) Transport(d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives.In the following question, select the odd lettersfrom the given alternatives.(a) IFC(b) LIF(c) SPM(d) GDZ(d)961F(d)961F(d)961F(d)961F(a)1F(b)1111711	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) 11 - 26 16 - 33 (a) $11 - 26$ 16 - 33 (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ Ans : (b) 13 - 28 (d) $18 - 33$ (a) $13 - 28$ (d) $18 - 33$ (b) $13 - 33$ (c) $13 - 28$ (d) $18 - 33$ (d) $18 - 33$ (e) $13 - 28$ (f) $16 - 33$ (f) $16 - 33$ (f) $11 - 26$ (f) $16 - 33$ (f) $13 - 28$ (f) $16 - 33$ (f) $13 - 28$ (f) $11 - 26$ (f) $16 - 33$ (f) $13 - 28$ (f) $11 - 26$ (f) $11 - 26$ (f) $11 - 26$ (f) $11 - 26$ (f) $11 - 33$ (f) $13 - 28$ (f) $11 - 26$ (f) $11 - 33$ (f) $13 - 28$ (f) $11 - 33$ (f) $13 - 28$ (f) $11 - 33$ (f) $13 - 28$ (f) $13 - 33$ (f) $13 - 28$ (f) $13 - 33$ (f) $13 -$
Ans transpir given 13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport (d) Car, Bus and Truck are all come under the bortation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ (d) 9 6 3 1 F C (b) $\begin{array}{c} 12 & 9 & 6 \\ L & I & F \\ -3 & -3 \end{array}$ (b) $\begin{array}{c} 12 & 9 & 6 \\ L & I & F \\ -3 & -3 \end{array}$ (c) $\begin{array}{c} 19 & 16 & 13 \\ -3 & -3 \end{array}$ (c) $\begin{array}{c} 19 & 16 & 13 \\ -3 & -3 \end{array}$ (d) $\begin{array}{c} 7 & 4 & 26 \\ G & D & Z \end{array}$	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) 11 - 26 16 - 33 (a) $11 - 26$ (b) $16 - 33$ (a) $11 - 26$ (b) $16 - 33$ (b) $11 - 26$ (c) $18 - 33$ (c) $13 - 28$ (c) $18 - 33$ (a) $13 - 28$ (c) $18 - 33$ (b) $13 - 33$ (c) $13 - 28$ (c) $18 - 33$ (c) $13 - 28$ (c) $18 - 33$ (c) $13 - 28$ (c) $16 - 33$ (c) $13 - 28$ (c) $16 - 33$ (d) $18 - 33$ (e) $13 - 28$ (f) $18 - 33$ (f) $13 - 28$ (f) $18 - 33$ (g) $13 - 28$ (f) $18 - 33$ (h) $13 - 28$ (f) $18 - 33$ (h) $13 - 28$ (f) $18 - 33$ (h) $13 - 28$ (h) $14 - 33$ (h)
Ans transpigiven 13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ (d) $9 \begin{array}{c} 6 \\ 1 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ 1 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 9 \\ -3 \end{array} \begin{array}{c} 6 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} -3 \\ -3 \end{array} \begin{array}{c} 0 \\ -3 \end{array} \begin{array}{c} 12 \\ -3 \end{array} \begin{array}{c} 0 \\ \end{array}{c} 0 \end{array} \begin{array}{c} 0 \\ -3 \end{array} \begin{array}{c} 0 \\ -3 \end{array} \begin{array}{c} 0 \end{array} \begin{array}{c} 0 \\ -3 \end{array} \begin{array}{c} 0 \end{array}{0} \end{array}{ \end{array}{c} 0 \end{array} \begin{array}{c} 0 \end{array} \begin{array}{c} 0 \end{array}{\end{array} \begin{array}{c} 0 \end{array} \end{array}{ \end{array}{c} 0 $	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ Ans : (b) (a) $11 - 26$ (b) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ (a) $13 - 28$ (d) $18 - 33$ (b) $13 - 33$ (c) $13 - 28$ (d) $18 - 33$ (c) $13 - 28$ (d) $16 - 33$ (c) $13 - 28$ (d) $18 - 33$ (c) $13 - 28$ (d) $18 - 33$ (c) $13 - 28$ (d) $18 - 33$ (d) $18 - 33$ (e) $13 - 28$ (f) $16 - 33$ are different number from the given alternatives. 19. According to dictionary, which of the following word will come at second position? (1) Easily (2) Earmark
I2. Ans transpigiven 13.	from the given alternatives. (a) Car (b) Bus (c) Truck (d) Transport (d) Car, Bus and Truck are all come under the portation. So, transport is the odd word from the alternatives. In the following question, select the odd letters from the given alternatives. (a) IFC (b) LIF (c) SPM (d) GDZ (d) 9 6 3 1 F C (b) $\begin{array}{c} 12 & 9 & 6 \\ L & I & F \\ -3 & -3 \end{array}$ (b) $\begin{array}{c} 12 & 9 & 6 \\ L & I & F \\ -3 & -3 \end{array}$ (c) $\begin{array}{c} 19 & 16 & 13 \\ S & P & M \\ -3 & -3 \end{array}$ (d) $\begin{array}{c} 7 & 4 & 26 \\ G & D & Z \\ -3 & -4 \end{array}$	Ans : (d) The number 23, 37 and 41 are indivisible where as 51 are divisible number. So, 51 are the odd number from the given alternatives. (a) 11 - 26 (b) 16 - 33 (c) 13 - 28 (d) 18 - 33 Ans : (b) 11 - 26 16 - 33 (a) $11 - 26$ 16 - 33 (a) $11 - 26$ 16 - 33 (b) $11 - 26$ 16 - 33 (c) $13 - 28$ (d) $18 - 33$ Ans : (b) 13 - 28 (d) $18 - 33$ (a) $11 - 26$ 16 - 33 (b) $11 - 26$ 16 - 33 (c) $13 - 28$ (d) $18 - 33$ (c) $13 - 28$ (d) $18 - 33$ (d) $18 - 33$ (e) $13 - 28$ (f) $18 - 33$ (f) $18 - 33$ (g) $18 - 33$ (h) $18 - 33$ (h) $18 - 33$ (h) $11 - 26$ 16 - 33 (h) $18 - 33$ (h) $18 - 33$

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(a) Earmark (b) Earthy Ans: (d) (d) Easily (c) Ease +2 $\frac{20}{7}$ +2 $\frac{22}{7}$ +2 $\frac{24}{7}$ $\frac{24}{7}$ 18 26 Ans : (a) According to dictionary, the position of the words are-Ear 5 -2^{nd} position Ear mark Ē Earthy 19 $K \xrightarrow{+2} M \xrightarrow{13} 0 \xrightarrow{+2} 0$ Ease Easily S So, Earmark is the word will come at second position So, \Rightarrow ZES is the ones that will complete the series. from given words. A series is given with one term missing. Select 24. From the given alternatives, according to 20. the correct alternative from the given ones that dictionary, which word will come at LAST will complete the series. position? KPM, PVR, UBW, ZHB, ? (b) Ointment (a) Opaque (b) NGT (a) LQU (c) Orderly (d) Ordinary (c) ENG (d) HIR Ans: (d) According to dictionary their order is-Ans : (c) Ointment $K \xrightarrow{+5} P \xrightarrow{16} U \xrightarrow{+5} Z \xrightarrow{21} Z \xrightarrow{26} Z$ 5 Opaque Orderly E – 4th position or last position. Ordinary 14 $16 \xrightarrow{+6} V \xrightarrow{+6} B \xrightarrow{+6} H$ So, ordinary is the last word of given word from N dictionary Arrange the given words in the sequence in 21. $^{13}_{M} \xrightarrow{+5}_{R} ^{18} \xrightarrow{+5}_{W} ^{23} \xrightarrow{+5}_{B} ^{2}$ 7 which they occur in the dictionary. G (1) Outlook (2) Outlet (3) Outburst (4) Ornament So, \Rightarrow ENG is the ones that will complete the series. (5) Outrageous 25. In the following question, select the missing (b) 34215 (a) 43215 number from the given alternatives. (c) 25341 (d) 52341 35, 39, 48, 64, 89, ? Ans : (a) Arrangement of words according to the (a) 169 (b) 120 sequence in the dictionary are-(c) 125 (d) 134 Ornament Ans: (c) Outburst Outlet Out look +9 16 Outrageous A series is given with one term missing. Select 22. $(2)^2$ $(4)^2$ $(5)^{2}$ (6) (3) the correct alternative from the given ones that So, 125 is the missing number from the given will complete the series. alternatives. LMK, FGE, ZAY, TUS, ? In the following question, select the missing 26. (a) BMO (b) SRB number from the given alternatives. (c) LZD (d) NOM 41, 13, 54, 67, 121, ? Ans: (d) (a) 143 (b) 188 $L^{2} \xrightarrow{-6} F \xrightarrow{-6} Z \xrightarrow{-6} T \xrightarrow{-6} T$ 14 (c) 194 (d) 168 Ν **Ans : (b)** 41 + 13 = 5413 + 54 = 67 $M \xrightarrow{13} -6 \xrightarrow{7} G \xrightarrow{-6} A \xrightarrow{1} -6 \xrightarrow{21} U \xrightarrow{-6}$ 15 54 + 67 = 121Ō 67 + 121 = 188 $\begin{array}{c} 11 \\ \kappa \xrightarrow{-6} E \xrightarrow{5} -6 \xrightarrow{25} Y \xrightarrow{-6} S \end{array}$ 13 So \Rightarrow 188 is the missing number from the given alternatives. Note- The sum of the previous two numbers is the next So, \Rightarrow NOM is the ones that will complete the series number. 23. A series is given with one term missing. Select 27. In the following question, select the missing the correct alternative from the given ones that number from the given alternatives. will complete the series. 9, 23, 50, 103, 208, ? RSK, TVM, VYO, XBQ, ? (a) 323 (b) 411 (a) RGT (b) YFA (c) 417 (d) 431 (c) LQT (d) ZES

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42. Which of the following cube in the answer figure cannot be made based on the unfolded cube in the question figure?



In the following figure, square represents

lawyers, triangle represents cyclists, circle

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 Ans : (b) The economist who for the first time scientifically determined National Income in India was Vijendra Kasturi Ranga Vardraj Rao (V.K.R.V. Rao). ⇒ Jagdish N. Bhagwati is an Indian economist who is known for their contribution in research of international trade. The Government of India awarded him with 'Padam Vibhushan' in 2000. ⇒ Amrtya Sen is the first Asian to win Nobel prize in the field of economics in 1998. He demonstrated the concept of public welfare economics. He has also been awarded with the 'Bharat Ratna' in 1999. 54. Which of the following is not a part of the nonplan expenditure of central government? (a) Interest payment (b) Grants to states (c) In the Budget document the gross revenue expenditure has divided into planned expenditure and non-planned expenditure. Non-planned expenditure includes – Payment of debts, Defense Services, Economic aid, Administrative services. While planned expenditure includes the aid provides for the execution of schemes sponsored by centre, state and union territories like – Agriculture. Rural development. 	 58. Which one of the following cannot be the ground for proclamation of Emergency under the Constitution of India? (a) War (b) Armed rebellion (c) External aggression (d) Internal disturbance Ans : (d) The emergency provisions are contained in part-18 of the Indian Constitution, from Articles 352 to 360. The Constitution stipulates three types of emergencies – (i) National emergency due to war, external aggression or armed rebellion (Article 352) (ii) President's rule due to the failure of the constitutional machinery in the state. (Article 356) (iii) Financial emergency due to a threat to the financial stability or credit of India (Article 360). Emergency can't be proclaimed on the basis of Internal disturbances. 59. The 100th amendment in Indian Constitution provides
 The percentage of decadal growth of population of India during 2001-2011 as per census 2011 is	 (a) Flotection of inventioud and regulation of street vending (b) Acquiring of territories by India and transfer of certain territories to Bangladesh (c) Emoluments, Allowances and Privileges to the Governors
(c) 19.21 (d) 21.54 Ans : (b) The percentage of decadal growth of population of India during 2001–2011 as per census 2011 is 17.64%. According to this census the total population is 1,21,05,69,573 in which the male population is 62,31,21,843 (51.47%) and the female population is 58,74,47,730 (48.48%). The sex ratio in India is 943 i.e. 943 females per 1000 males. Population density is 382 person/km ² .	 (d) Reorganization of state of Andhra Pradesh Ans : (b) The 100th amendment 2015, in Indian Constitution proposed to amends the First Schedule of Constitution by which a national transfer of 111 Indian enclaves to Bangladesh in return of 51 enclaves to India established in West Bengal, Assam, Tripura and Meghalaya. Hence option (b) is correct. 60. Which one of the following is not a constitutional body?
 56. The concept of Constitution first originated in which of the following countries? (a) Italy (b) China (c) Britain (d) France 	 (a) The Election Commission of India (b) The Finance Commission (c) The Official Language Commission (d) The National Commission for Women
the political system of any country by which the peoples are ruled. The concept of constitution first originated in the Britain in 1215 A.D. It is important that constitution is divides into two groups – written constitution and unwritten constitution. Countries with written constitution are – India, Australia, USA etc. While the countries with unwritten constitution are – Britain, Israel, New Zealand 57. The Parliament has been given power to make	Ans : (d) Constitutional bodies are those described in the Constitution of India. Constitutional bodies are – Election Commission, Finance Commission, Union Public Service Commission, State Public Service Commission, Commission for official language, Comptroller and Auditor General of India, Attorney General of India, Advocate General of the states, National Commission for SCs, STs etc. While The National Commission for women is a statutory body established in 1992.
 and a structure of the constitution of India? (a) Article 5 (b) Article 7 (c) Article 9 (d) Article 11 	61. Which Buddhist scripture describes about 16 Mahajanapadas? (a) Digha Nikaya (b) Sutta Pitaka (c) Anguttara Nikaya (d) Vinaya Pitaka
Ans: (d) The Constitution of India deals with the citizenship from Articles $5 - 11$ under part-2. Under Article 11, parliament shall have the power to make any provision with respect to the citizenship. That means parliament can make any provision with respect to the acquisition and termination of citizenship and all other matters relating to citizenship. Like Canada Indian Constitution provides for only a single citizenship.	Ans: (c) Augutata Yukaya (d) Villaya Haka Ans: (c) Buddhist scripture Anguttara Nikaya describes about 16 Mahajanpadas. While Sutta Pitaka describes about the Jataka stories, the stories of previous births of Buddha, and the collection of Buddhist teachings Vinaya Pitaka describes about rules and regulation and daily life for monks and mins. Abhidhamma Pitaka describes about Buddhist philosophy which is in the form of Que. and Ans.
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The Chinese Pilgrim who visited India in the (b) Rajkumari Amrit Kaur 62. early 6th century was (c) Kamladevi Chattopadhyaya (a) Hiuen Tsang (b) Fa-hien (d) All options are correct (c) Sung Yun (d) I-tsing Ans: (d) Gandhiji, alongwith the selected 78 members of the Sabarmati Ashram, belonging to every region and Ans: (c) The chinese Pilgrim Sung Yun visited India in the early 6th century A.D. Besides this Fa-hien came to religion of India, marched on 12 March 1930 from Ahmadabad to the coast of Dandi and on 6 April 1930 India in the reign of Chandragupta-II Vikramaditya. by picking up a handful of salt break the salt law and While Hiuen Tsang came in the reign of inaugurated the civil disobedience movement and hence Harshavardhana. I-tsing came to India in the later 7th defiance of salt law started all over the country by century A.D. various leaders or groups. In different regions of the Which one of the following was the capital of 63. country it was in different forms like in eastern India-no the sultanate during the reign of Iltutmish? tax campaign, defiance of forest law in Maharashtra, (a) Agra (b) Lahore Karnataka and the central provinces, in Assam against (c) Badaun (d) Delhi 'Cunningham circular' etc. Gandhiji specially asked the Ans: (d) Iltutmish (1210-1236 A.D.) made the capital women to play a leading role in this movement on the advice of Kamladevi Chattopadhyaya. Sarojini Naydu, of sultanate to Delhi in place of Lahore. Being an Ilbari Satyavati Devi, Kamala Nehru, Rajkumari Amrit Kaur, turk he was the real founder of Delhi Sultanate. He Kasturba Gandhi, Vijaylaxmi Pandit etc. were the leading women in this movement. strengthened the position of sultanate by defeating their rivalries of throne like Yaldoz and Qubacha. Safeguarded the North-Western frontier from Mongols Which among the following is not the result of 66. by not allowing the Khwarizm prince Jalauddin underground water action? Mankbarni to enter beyond Indus valley. He laid the (a) Fiords Sink holes (b) foundation of absolute monarchy of the tanka in (c) Stalactite (d) Stalagmite Northern India. He created an entirely new and Ans: (a) Water from the rainfall received on the earth's important class of officers called chalisa (Chehalgan) or surface seeps through the ground and accumulated 'the forty'. He also secured a letter of investiture from under the ground surface is called ground water which the Abbasid Caliph of Baghdad which also established gushes out in the form of springs. The land forms him as the 'Sultan of Hindustan'. Being an orthodox created by the actions of groundwater are sink hole, sunni his view towards other was harsh but not cruel. caves, stalactites and stalagmites, cave pillars etc. He had desecrated the magnificent Hindu temples of \Rightarrow Fiords are formed when the lower end of the trough Bhilsa and Ujjain. He also introduced a purely arabic is drowned by the sea and forms a deep steep-side inlet. currencies of gold and silver and two very important These are formed mainly on Norwegian and South measures of the time the Silver Tanka and Copper's Chilean coast. Jital. He was a great patron of art and learning. Also In which of the following countries the Great 67. completed the construction of Qutubminar. Victorian Desert is located? 64. The ideas of non-cooperation movement during (a) South Africa (b) South America freedom struggle did not envisage on (c) Australia (d) China (a) the boycott of civil services Ans: (c) Australia is the smallest continent of the world (b) the boycott of foreign goods by land area as well as by population. It is situated in (c) Common riots (violence) southern hemisphere and the tropic of Capricorn divides (d) the surrender of British titles it into equal parts. The major deserts in Australia are -Ans: (c) The non-cooperation movement was launched Great Victorian, Great sandy, Simpson, Gibson etc. formally on 1 August 1920. On 9 June 1920, the Deserts found in Africa are Sahara, Kalahari, Namib etc. Khilafat Committee at Allahabad unanimously accepted Deserts found in South America are - Atacama, \Rightarrow the suggestion of non-cooperation and asked Gandhiji Patagonian etc. to lead the movement. There were two main propaganda Deserts found in China are - Takla Makan of movement in which one was by the constructive works like setting up of National Schools, Colleges, Which of the following is a typical feature of 68. river erosion in youthful stage? Panchayats for settling disputes, hand spinning and weaving was to be encouraged, Hindu-Muslim unity, give (a) George (b) Cut-bank up untouchability, non-violence etc. and second was (c) Ox-bow lake (d) Natural Levee negative work like surrender of titles and honors, boycott Ans: (a) The features found in youthful stage of a river of government affiliated schools and colleges, law courts, are all formed by the process of Erosion. The main features are-V-shaped valley, George, Waterfalls, foreign cloth, resignation from government services, mass civil disobedience, non-payment of taxes etc. Potholes etc. The river erodes downwards in its While the common riots were not the part of movement youthful stage, called vertical erosion. The result of but happened accidentally in Chauri-Chaura in Gorakhpur District of U.P. on 5 Feb. 1922 which such erosion is a valley with steep sides and very narrow floors which looks like a "V". But when it meets resulted the end of the movement unfortunately. with an obstacles of hard rock, being unable to cut them it flows around them and forms a George like shape. Who among the following participated in the 65. \Rightarrow Ox-bow lake, Natural levees formed in old age Salt Satyagarha of Gandhiji? stage while cut-banks are found in matured stage. (a) Sarojini Naidu

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 69. Which of the following Indian state does not share boundary with Myanmar? (a) Assam (b) Manipur 	Ans : (c) Bharat Net project is the new brand name of National optical Fibre network (NOFN), which was launched in October, 2011 to provide broadband
(c) Nagaland (d) Arunachal Pradesh Ans : (a) The Indian states bordering with Myanmar is Arunachal Pradesh, Nagaland, Mizoram and Manipur. While Assam boundaries with Bangladesh. Other states sharing boundaries with Bangladesh are West Bengal, Meghalava, Tripura, Mizoram.	connectivity to all 2.5 lakh Gram Panchayats. It was renamed Bharat net in 2015. The objective of this scheme is to provide high-speed broadband of 100 mbps to all the panchayats in the country by March 2019. The project is being funded by the universal service obligation fund (USOF) which was established to improve telecom particular and rural areas of India. The project
70. Bhavanisagar Dam or Lower Bhavani Dam, is	is to be implemented in three phases.
located in which state?	74. Which of the following countries will host the
(a) Tripura (b) Bihar	Commonwealth Games in 2018?
(c) Tamii Nadu (d) Telangana	(a) Sri Lanka (b) Indonesia (c) Australia (d) Britain
Ans . (c) The Bhavanisagar Dan of Lower Bhavan Dam is located on the Bhavani river between Mettupalayam and Sathyamangalam in Erode district, Tamilnadu. This dam is considered to be among the biggest earthen dams in the country. Other important	Ans : (c) The 2018 common wealth games, officially known as the 21st common wealth games were held on the `Gold coast', Queensland, Australia between 4 to 15 April, 2018. Australia topped with highest number of
dams are – Idukki dam on Periyar river in Kerala, Bhima project in Telangana on Pavna river. Kosi	medal (198). India ranked third in the game with 66 medal (26 gold). 22^{nd} common wealth game will be
Project in Bihar on Kosi river etc.	held in 2022 in Birmingham, Britain.
71. Which of the following is a scheme of Government of India for providing online connection of LPG?	75. In December 2017, who won the World Rapid Chess Championship Title 2017 held in Riyadh, Saudi Arabia?
(a) SAHAJ (b) SARAL	(a) Magnus Carlsen
(c) BHIM (d) DIGI DHAN	(b) Viswanathan Anand (c) Vladimir Fedoseev
Ans : (a) Union Government has launched Sahaj	(d) Ian Nepomniachtchi
launched by Union Minister for Petroleum and Natural	Ans : (b) In December 2017, the Indian grandmaster
gas on 30 August 2015. A unified web portal	Vishwanathan Anand won the world rapid chess
www.mylpg.in is available in 13 languages for booking Initially the scheme has been launched in 12	was the first recipient of the Rajiv Gandhi Khel Ratna
cities across the country. New system would be	award in 1991-92. He was also awarded the Padma
available on the websites of each oil company and the	Vibrushan, the first sports person to receive the award.
government's LPG portal Panal.	(a) Arundhati Roy
all-round development of adolescent girls in the	(b) Fatima Bhutto
age group of 11-18 years and making them self-	(c) Dinanath Gopal Tendulkar
reliant?	(d) Harper Lee $Ans \cdot (c)$ 'Gandhi in champaran' is written by Dinanath
(a) KUSEAO (b) IUMSI (c) NMEW (d) RMK	Gopal Tendulkar. He is famous for writing of an eight
Ans : (a) The Rajiv Gandhi Scheme for Empowerment of	volume biography of Mahatma Gandhi.
Adolescent Girls Sabla is a centrally sponsored program of	\Rightarrow Arundhati Roy's 'the God of small things' won the man booker prize in 1997 for fiction
government of India initiated on April 1, 2011 under ministry of women and child development. The basic	\Rightarrow Fatima Bhutto is a Pakistani writer known for her
objective of the scheme are to enable self development and	notable work in nonfiction about her family –
empowerment of adolescent girls improvement in their	Songs of blood and sword \rightarrow Harper Lee is an American novelist known for her
hygiene adolescent reproductive and sexual health family	notable work–'To kill a Mochingbird, Go set a
and child care. Also upgrading their home based skills, life	watchman.
skills and vocational skills. A ``Kishori Card" will be given	77. Who among the following has received Arjuna Award in August 2017?
\Rightarrow The program would cover adolescent girls (only out	(a) Harmanpreet Kaur (b) Sardar Singh
of school) 11-18 years old under all integrated child	(c) Bhupender Singh (d) P.A. Raphel
development services projects.	Ans : (a) In August 2017 total 17 sportsperson has been
73. Bharatnet Project is related to which of the following?	sporting award bestowed upon sportsperson for
(a) free wifi to students in rural area	consistently outstanding performance for four years.
(b) High speed internet to farmers	Harmanpreet Kaur is an Indian cricketer awarded with
(c) Broadband connectivity to gram panchayats	(cricket) Khushir Kaur (Atheletics) Mariyannan (Para-
(a) A project connecting rural area with urban area	atheletics) etc.
SSC JE Online Mechanical 2018 (Ex. date 22.1.2018) 03.15 nm 4	5

78. Which of the following is the 14 th Intangible Cultural Heritage from India to be listed in UNESCO's list of Intangible Cultural Heritage of Humanity?	programmed by a human to translate the user commands. Examples of input devices are – Keyboard, Mouse, Joysticks, Trackball, Light pen, Bar-code reader. Scanner etc.
(a) Ramlila (b) Mudivett	83 Which of the following is slaked lime?
(c) Kumbh Mela (d) Sankirtana	(a) $C_2(OH)$, (b) C_2O
Ans : (c) The intergovernmental committee for	$ \begin{array}{c} (a) & Ca(OII)_2 \\ (b) & CaO \\ (c) & CaO \\ (d) $
safeguarding of intangible cultural heritage under	Ans : (a) Calcium hydroxide (Ca(OH) ₂) is also called
UNESCO has inscribed 'Kumbh Mela' the 14 th	the slaked lime. It is obtained when calcium oxide is
UNESCO's Representative list of intangible cultural	mixed, or slaked with water. Aqueous solutions of
Heritage of Humanity during its 12 th session of	Ca(OH) ₂ are called lime water and it turns milky in the
committee held on 4-9 December 2017 at Jeju, South	presence of CO_2 due to formation of Calcium
Kumbh Mela' is held every third year at one of four	Carbonate. This is used in whitening of walls. Other
places by rotation Haridwar Allahahad Nashik Ujiain	uses are in the making of Bleaching Powder, Caustic
and thus it is held at each of these places every twelfth	Soda, Sodium Carbonale, Cemeni, Drugs etc. for
vear. Other sites are – Ramlila, Sankirtana, Chhau	reducing the actury of failulit call be used.
dance etc.	84. Among the following respiration is which type
79. The Union Finance Ministry's Revenue	(a) Exothermic process only
Department has imposed a five year anti-	(b) Endothermic process only
dumping duty on Sodium nitrite imports from	(c) Both exothermic and endothermic
which of the following country?	(d) Neither exothermic nor endothermic
(a) Japan (b) China	(d) Reactions in which energy is released called
(c) United States of America (d) Russia	exothermic reaction All combustion reactions are
Ans : (b) The Union Finance Ministry's Revenue	exothermic. Respiration is an exothermic process
department has imposed a five year antidumping duty	because in this \dot{CO}_2 presents in food breaks down to
on Sodium Nitrite Imports from China. For this purpose	form glucose and this glucose combines with oxygen in
supported by Punjab Chemical and Crop Protection Ltd	the cells of our body and releases high amount of
90 Which neighboring country of India calabrates	energy. Photosynthesis and other microprocessor are
its Independence Day on March 26?	other example.
(a) Bangladesh (b) Pakistan	85. In Modern Periodic Table, while moving left to
(c) Nepal (d) Sri Lanka	character
(c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of	character (a) increases
(c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It	(a) increases (b) decreases
(c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of	 (a) increases (b) decreases (c) remain same
(c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25	 (a) increases (b) decreases (c) remain same (d) first increases then decreases
(c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25 March 1971. While Pakistan and Sri Lanka celebrates its independence are an 4. August and 4. February	 (a) increases (b) decreases (c) remain same (d) first increases then decreases Ans : (b) Dmitri Mendeleev was the first scientist to
(c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25 March 1971. While Pakistan and Sri Lanka celebrates its independence day on 14 August and 4 February respectively.	 (a) increases (b) decreases (c) remain same (d) first increases then decreases Ans : (b) Dmitri Mendeleev was the first scientist to explain this. According to him the physical and
(c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25 March 1971. While Pakistan and Sri Lanka celebrates its independence day on 14 August and 4 February respectively.	 (a) increases (b) decreases (c) remain same (d) first increases then decreases Ans : (b) Dmitri Mendeleev was the first scientist to explain this. According to him the physical and chemical properties of elements are periodic function of
 (c) Nepal (d) Sri Lanka Ans: (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25 March 1971. While Pakistan and Sri Lanka celebrates its independence day on 14 August and 4 February respectively. 81. Which of the following is NOT an operating system? 	 (a) increases (b) decreases (c) remain same (d) first increases then decreases Ans : (b) Dmitri Mendeleev was the first scientist to explain this. According to him the physical and chemical properties of elements are periodic function of their atomic number. In modern periodic table while
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 (c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25 March 1971. While Pakistan and Sri Lanka celebrates its independence day on 14 August and 4 February respectively. 81. Which of the following is NOT an operating system? (a) Unix (b) Ubuntu (c) MS-DOS (d) MS-Excel 	 Ans: (b) Dmitri Mendeleev was the first scientist to explain this. According to him the physical and chemical properties of elements are periodic function of their atomic number. In modern periodic table while moving left to right the metallic character decreases and non-metallic increases. In periodic table the horizontal lines are called periods and vertical lines are called groups.
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 (c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25 March 1971. While Pakistan and Sri Lanka celebrates its independence day on 14 August and 4 February respectively. 81. Which of the following is NOT an operating system? (a) Unix (b) Ubuntu (c) MS-DOS (d) MS-Excel Ans : (d) Operating system is a system software that manages computer hardware and software resources and provides common services for computer programs. For hardware functions such as input and output and memory allocation the operating system acts as an intermediary b/w software and hardware. Examples are – Unix, Linux, Ubuntu, M.S. Windows, Mac OS, MS-Dos etc. 	 Ans: (b) The mole is the unit of measurement for amount of substance in the SI units which is defined as the amount or sample of chemical substance that contains as many constitutive particles are periodic table that the there are the the there are there are there are the there are there are the there are the ther
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 (c) Nepal (d) Sri Lanka Ans : (a) Bangladesh, The neighboring country of India, celebrates its independence day on March 26. It commemorates the country's declaration of independence from Pakistan in the late hours of 25 March 1971. While Pakistan and Sri Lanka celebrates its independence day on 14 August and 4 February respectively. 81. Which of the following is NOT an operating system? (a) Unix (b) Ubuntu (c) MS-DOS (d) MS-Excel Ans : (d) Operating system is a system software that manages computer hardware and software resources and provides common services for computer programs. For hardware functions such as input and output and memory allocation the operating system acts as an intermediary b/w software and hardware. Examples are – Unix, Linux, Ubuntu, M.S. Windows, Mac OS, MS-Dos etc. ⇒ MS-Excel is a spreadsheet developed by Microsoft for calculation, graphing tools, pivot tables etc. 82. Instructions to computer are given through	(a) increases (b) decreases (c) remain same (d) first increases then decreases Ans : (b) Dmitri Mendeleev was the first scientist to explain this. According to him the physical and chemical properties of elements are periodic function of their atomic number. In modern periodic table while moving left to right the metallic character decreases and non-metallic increases. In periodic table the horizontal lines are called periods and vertical lines are called groups. 86. How many moles are present in 36 gm of water? (a) 1 (b) 2 (c) 4 (d) 8 Ans : (b) The mole is the unit of measurement for amount of substance in the SI units which is defined as the amount or sample of chemical substance that contains as many constitutive particles, e.g., atoms, molecules, ions etc. No. of moles = $\frac{\text{Given mass}}{\text{Molar mass}}$ since mass of water (given) = 36 molar mass of water = 18 Hence No. of moles = $\frac{36}{18} = 2$ mole.

87. In which mirror, image formed is virtual, erect	Ans: (b) Vitamin - Diseases caused by
(a) Plane (b) Convey	$(1) B_1 (1 \text{ hymine}) - Beri-Beri$
(a) France (b) Convex	(2) A (Retinal) - Night blindness (2) B (G 1 i G 1) - D i l (1 - 1) - D i
(c) Concave (d) No option is correct	(3) D (Calciferol) - Rickets
Ans: (b) A convex mirror or diverging mirror or fish	$(4) B_5$ (Niacin) - Pellagra
eye mirror is a curved mirror in which the reflective	92. Air enters the body of cockroaches through
surface bulges towards the light source. A parallel beam	(a) lungs (b) gills
The image formed in convex mirror is behind the mirror	(c) spiracles (d) skin
between the pole and the focus and the image formed is	Ans : (c) The scientific name of cockroaches is
smaller than the object and it is erect and virtual. These	periploneta. This is the animal of Phylum Arthopoda.
mirrors are utilized in motor cars trucks etc. as a rear	Like other insects, cockroaches breathe through a
view mirror	openings called spiracles on all body segments. The
88 Which of the following effects the resistance of	excretory organ of cockroach is the malpighian tubules
the wire?	It has 13 chambers in their hearts. It has open blood
(a) Resistivity	circulatory system with lack of hemoglobin. It is a
(b) Length of wire	nocturnal and omnivorous animal.
(c) Area of cross section of wire	93. Which of the following carry the blood from all
(d) All options are correct	parts of body back to the heart?
(d) An options are context	(a) Arteries (b) Veins
Ans: (d) The electrical resistance of an electrical	(c) White Blood Cells (d) Platelets
electric current through it and it depends upon	Ans : (b) The blood vessels which bring back the blood
resistivity of conductor length area of cross section of	from various organs of the body to the heart are called
wire temperature The SI unit of electrical resistance is	veins. Through veins only impure blood flows, but through
ohm (O)	pulmonary veins only pure blood flows from lungs to
80 Which of the following statements are	the heart to various organs of the body called arteries
CORRECT?	94 Which of the following is an example of
I. Force applied on the conductor depends on	unicellular organism?
magnitude of current.	I. Euglena
II Force applied on the conductor depends	II Amoeba
\mathbf{n}	11. / 11100.04
on magnitude of magnetic field strength.	III. Paramecium
on magnitude of magnetic field strength. III. Force applied on the conductor depends on	III. Paramecium (a) Only I and II (b) Only I and III
on magnitude of magnetic field strength.III. Force applied on the conductor depends on the direction of current.	III. Paramecium (a) Only I and II (b) Only I and III (c) Only II and III (d) All option are correct
 an anglitude of magnetic field strength. III. Force applied on the conductor depends on the direction of current. (a) Only I and II (b) Only I and III 	III. Paramecium (a) Only I and II (b) Only I and III (c) Only II and III (d) All option are correct Ans : (d) Unicellular organism consists of only one cell
 a) A contract of the conductor depends on magnitude of magnetic field strength. b) III. Force applied on the conductor depends on the direction of current. (a) Only I and II (b) Only I and III (c) Only II and III (d) All are correct 	III. Paramecium (a) Only I and II (b) Only I and III (c) Only II and III (d) All option are correct Ans : (d) Unicellular organism consists of only one cell falls into two categories – prokaryotic and eukaryotic.
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 97. Which of the following diseases are NOT caused by smog? (a) Rickets (b) Throat cancer (c) Stimulation (d) Parathing and here 	Ans : (d) An unconstrained rigid body in space has six degree of freedom : three translatory motions along X, Y and Z axes and three rotary motions around X, Y and Z axes are presentingly.
(c) Skin cancer (d) Breathing problem	Z axes respectively.
problems may caused by smog while Rickets is disease	6 DOF.
in children caused by the deficiency of Vitamin 'D' in	Å.
which bone pain, bone tenderness, chostochondral	φ
swelling, soft skull, short height and low weight are	
98 Which of the following gas is the second most	X
abundant gas by volume in atmosphere?	
(a) Nitrogen (b) Ozone	φ —
(c) Oxygen (d) Carbon dioxide	103 A mechanism can be classified into a structure
Ans : (c) The atmosphere is the layer of gases	when the degree of freedom is .
gravity. By volume dry air contains 78.09% nitrogen.	(a) 0 (b) $\overline{1}$
20.95% oxygen, 0.93% argon, 0.03% carbon dioxide etc.	(c) 2 (d) 3
Hence option (c) is correct.	Ans : (a) An assemblage of resistant bodies having no
99. With respect to humans, why is carbon	load having straining action called structure
monoxide a pollutant?	So, we can say a mechanism can be classified into a
(a) It reacts with sulphur dioxide	structure when the degree of freedom is zero.
(c) It reacts with hemoglobin	104. Which of the following is used for controlling
(d) It makes nervous system inactive	fluctuations in an engine?
Ans : (c) Carbon mono oxide is a colorless, odorless	(b) Flywheel
and tasteless gas that is slightly less dense than air. It is toxic to Remoglobic animals including humans. It is	(c) Governor
also called flue gas. Through respiration it reaches in	(d) flywheel and Governor both
the body and combines with hemoglobin to produce	Ans : (d) Flywheel–Flywheel used in machine serves as
carboxyl hemoglobin, which usurps the space in hemoglobin that normally carries oxygen but is in	a reservoir which store energy when supply of energy is
effective for delivering oxygen which causes death.	is more than supply.
Carbon monoxide reacts with hemoglobin 10 times	It controls the speed variation caused by fluctuation of
higher than oxygen.	turning moment during cycle of operation.
100. Oil spills is seen in which ecosystem?	[Fluctuation of speed (N_s) = Maximum speed of flywheel] Minimum speed of flywheel]
(a) Desert ecosystem (b) Grassiand ecosystem (c) Forest ecosystem (d) Marine ecosystem	Governor -Governor controls the fluctuation of speed
Ans : (d) Oil spills is seen in marine ecosystem	cause by load variation.
spills may be due to release of crude oil from tankers,	105. Which term defines the fluctuation of speed of
offshore platforms, drilling rigs and wells etc. This may	a flywheel in terms of angular speeds?
animals fishes flora and fauna etc. Marine ecosystem	(a) $\frac{2(\omega_1 - \omega_2)}{(\omega_1 - \omega_2)}$ (b) $\frac{2(\omega_1 + \omega_2)}{(\omega_1 - \omega_2)}$
is very rich in biodiversity.	$\omega_1 + \omega_2$ $\omega_1 + \omega_2$
General Engineering Mechanical	(c) $\frac{\omega_1 + \omega_2}{\omega_1 - \omega_2}$ (d) $\frac{\omega_1 - \omega_2}{\omega_2 - \omega_2}$
101. What kind of contact can be established for a	$(0) 2(\omega_1 - \omega_2) \qquad (0) 2(\omega_1 + \omega_2)$
higher pair?	Ans : (a) Coefficient of Fluctuation of Speed (C _s)–
(a) No contact (b) Surface contact (c) No contact (d) None of these	C = Fluctuation of Speed
Ans : (a) When two elements have line or point contact	Average of Maximum and Minimum Speed
while in motion is called higher pair.	$C = (N_1 - N_2) - 2(N_1 - N_2)$
Example : Gears, ball and roller bearing, cam and follower.	$C_{s} = \frac{(N_{1} + N_{2})/2}{(N_{1} + N_{2})/2} = \frac{(N_{1} + N_{2})}{(N_{1} + N_{2})}$
when two elements have surface (or area) contact while in motion are called lower pair	\therefore Angular speed $\omega = 2\pi N/60$
Example: Sliding pair, Turning pair, Screw pair etc.	$N_1 \rightarrow Maximum \text{ speed}, \omega_1 \rightarrow Maximum \text{ angular speed}$
102. How many degrees of freedom exist in a free	$N_2 \rightarrow Minimum \text{ speed}, \omega_2 \rightarrow Minimum \text{ angular speed}.$
body in space?	$ = \left \sum_{\alpha_1 = 1}^{\infty} 2(\omega_1 - \omega_2) \right $
(a) 3 (b) 4 (c) 5 (d) 6	\sim $C_s - \frac{\omega_1 + \omega_2}{\omega_1 + \omega_2}$
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106. What is the velocity ratio for a slip in the behavior drive system?	Ans : (b) Frictional Torque Transmitted by a Disc/Plate Clutch–
(a) $\frac{N_1}{N_1} = \frac{d_1 + t}{d_1 + t} \left(1 - \frac{s}{d_1 + t}\right)$	$T = n\mu W R_{mean}$
(u) N ₂ d ₂ +t (1100)	n = no. of pair of contact surface
(b) $N_2 = d_1 + t \begin{pmatrix} s \end{pmatrix}$	n = 2 for single disc.
(b) $\frac{1}{N_1} = \frac{1}{d_2 + t} \left(1 - \frac{1}{100} \right)$	$\left[R_{\text{mean}} = \frac{r_1 + r_2}{2} \right] \rightarrow (\text{When uniform wear case})$
(c) $\frac{N_2}{N_1} = \frac{d_1 - t}{d_2 + t} \left(1 - \frac{s}{100} \right)$	$\left[R_{\text{mean}} = \frac{2}{2} \left[\frac{(r_1)^3 - (r_2)^3}{(r_1)^2 - (r_2)^2} \right] \right] \rightarrow \text{(When uniform)}$
(d) $\frac{N_2}{N_1} = \frac{d_2 + t}{d_1 + t} \left(1 - \frac{s}{100} \right)$	$\begin{bmatrix} 3 \lfloor (r_1) - (r_2) \end{bmatrix} \end{bmatrix}$ pressure case)
Ans · (b) Velocity Ratio of Belt Drive-	Where $r_1 \rightarrow External radius of friction face.$
	$r_2 \rightarrow$ Internal radius of friction face.
$\left \frac{1}{N} - \frac{1}{d} \right $	$\mu \rightarrow \text{Coefficient of friction.}$ $n = (n_1 + n_2 - 1)$ for multiplate clutch
$\begin{bmatrix} 1 1_1 & 1_2 \end{bmatrix}$	Where $n_1 \rightarrow N_0$ of disc on driving shaft
Where d ₁ Diameter of driver	$n_2 \rightarrow N_0$ of disc on driven shaft
$d_2 = D_1$ ameter of follower.	Torque transmitted by flat collar bearing used same
N_1 = Speed of driver in r.p.m.	formula as above for disc/plate clutch.
N_2 = Speed of follower in r.p.m.	$[T = n\mu W R_{mean}]$
velocity ratio	$\left\ \left[R_{\text{mean}} = \frac{r_1 + r_2}{2} \right] \rightarrow \text{(When uniform wear case)} \right\ $
$\Rightarrow \qquad \left \frac{N_2}{N} = \frac{d_1 + t}{d_1 + t} \right $	
$\begin{bmatrix} \mathbf{N}_1 & \mathbf{d}_2 + \mathbf{t} \end{bmatrix}$	$\left\ \left\ \mathbf{R}_{\text{mean}} = \frac{2}{2} \right\ \frac{(\mathbf{r}_{1}) - (\mathbf{r}_{2})}{(\mathbf{r}_{1})^{2} - (\mathbf{r}_{2})^{2}} \right\ $
Slip of Belt–Due to insufficient frictional grip against	$\begin{bmatrix} 1 \\ 1 \end{bmatrix} = 3 \begin{bmatrix} (r_1)^2 - (r_2)^2 \end{bmatrix}$
Now velocity ratio will be	\rightarrow (When uniform pressure case)
	109. What should be the incremental factor for the
$\Rightarrow \qquad \left \frac{N_2}{N_2} = \frac{d_1 + t}{1 - \frac{S}{N_2}}\right $	number of shoes, if the engagement speed for
$N_1 d_2 + t 100)$	the centrifugal clutch needs to be doubled?
107. Which of the following is NOT classified as	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
types of link?	(c) 2 $(d) 4$
(a) Rigid link (b) Flexible link	clutch needs to be doubled then the incremental factor
(c) Fluid link (d) None of these	for the number of shoes are 2.
Ans : (d) Classification of Link–	Note: Option (d) is given by commission.
Link	110. Two gears are said to have a conjugate motion
+	$\frac{\text{if}}{(2)}$
Rigid link Flexible link Fluid link	(a) they have a very small fluctuating angula velocity (b) they have variable angular velocity
Rigid Link-Rigid link is a resistant body that transmit	(c) they have constant angular velocity
motion without any appreciable deformation. e.g	(d) they have very high fluctuating angula
Crank, pistion and cylinder etc.	velocity
Flexible Link –A flexible link is a resistant kinematic	Ans : (c) The gears must be designed such that the ratio
link that undergoes partial deformation when	of rotational speeds of driven and driver gear is always
Fluid Link In this type of link the motion is	constant. When the tooth profiles of two meshing gears
transmitted with the help of fluid pressure e_{α} hydraulic	they are said to be executing conjugate action
brake etc.	they are said to be excerting conjugate action.
108. Which of the following can be said to be	That is $\frac{\omega_1}{\omega_1} = \text{Constant}$
equivalent with the frictional torand	ω_2
transmitted by a disc or plate clutch?	where $\omega_1 =$ Angular velocity of the driver.
(a) Flat pivot bearing	ω_2 = Angular velocity of the driven.
(b) Flat collar bearing	111. Which of the following is CORRECT for the
(c) conical pivot bearing	speed ratio of a gear train?
(d) Trapezoidal pivot bearing	(b) Speed of driven/speed of driver



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