

# DMRC–Junior Engineer (Mechanical) Exam-2016\*

## PAPER-I

### LOGICAL ABILITY, QUANTITATIVE APTITUDE & GENERAL AWARENESS

**Directions (Qs. No. 1 & 2) :** *The questions are based on the following information.*

Out of the total 390 students studying in a college of Arts and Science, boys and girls are in the ratio of 7 : 6 respectively and the number of students studying Arts and Science are in the ratio of 3 : 7 respectively. The boys and girls studying Arts are in the ratio of 4 : 5 respectively.

- How many boys are studying Science?  
A. 155                      B. 156  
C. 158                      D. None of these
- What is the ratio between the girls studying Arts and Science respectively?  
A. 8 : 13                      B. 13 : 23  
C. 23 : 36                      D. None of these
- “SAWEN” is a regional international government body:  
A. In combating wildlife crime in the region  
B. In combating regional terrorism  
C. For health & welfare programs  
D. For poverty alleviation in region
- World’s first white tiger safari was recently opened in the state of:  
A. Gujarat                      B. Maharashtra  
C. Madhya Pradesh      D. Assam
- India’s first indigenous rotavirus vaccine named rotavac:  
A. Is to combat infant mortality due to jaundice  
B. Is to combat infant mortality due to diarrhoea  
C. Is to combat adult Japanese encephalitis  
D. Is inactivated polio vaccine

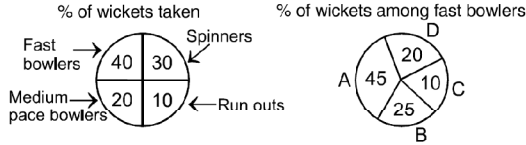
- Who was recently conferred with Skoch Lifetime Achievement award?  
A. Sushma Swaraj  
B. Suresh Manohar Parrikar  
C. Suresh Prabhu  
D. M. Venkaiah Naidu
- 2015–2016 Irani cup cricket title was won by  
A. Rest of India  
B. Mumbai  
C. Delhi  
D. Karnataka

**Directions (Qs. No. 8) :** *The following question is followed by two statements I and II. Select the choice as follows.*

- If statement I alone is sufficient to answer the question.
  - If statement II alone is sufficient to answer the question.
  - If statement I and II are both required to answer the question.
  - If both statements I and II are insufficient to answer the question and more data is required.
- Can Mohan be considered a successful mountaineer:  
I. Mohan has taken part in seven mountaineering expeditions in the last ten years.  
II. The norm for a mountaineer to be considered successful is being a member of expeditions 4 to 5 times in fifteen years.  
A. (a)                      B. (b)  
C. (c)                      D. (d)

\* Exam Held on 17-04-2016.

**Directions (Qs. No. 9) :** The following are the statistics of some matches of a cricket team bowlers and the wickets taken. A, B, C & D are the fast bowlers of the team.



9. If the inter-se wicket taking ratio between bowler groups remains the same and the run out are limited to 2 only, how many more wickets would spinners take, based on the original presumption that spinners took 15 wickets earlier:
  - A. 1
  - B. 2
  - C. 3
  - D. 0
10. Which actor has been selected for the prestigious 47th Dadasaheb Phalke Award for the year 2015?
  - A. Dilip Kumar
  - B. Amitabh Bachchan
  - C. Satrugan Sinha
  - D. Manoj Kumar
11. Union Government recently gave nod for issuance of UDAY bonds to four states of India initially. One of the states is not included in this?
  - A. Uttar Pradesh
  - B. Bihar
  - C. Rajasthan
  - D. Chattishgarh
12. Which more suitable for crops like cashew nut?
  - A. Red laterite soil
  - B. Black soil
  - C. Alluvial soil
  - D. Arid soil
13. Two equal glasses filled with alcohol & water in the proportion 2 : 1 and 3 : 2 are emptied into a third glass. The proportion of alcohol and water in the third glass will be:
  - A. 13 : 17
  - B. 19 : 7
  - C. 13 : 11
  - D. 19 : 11

**Directions (Qs. No. 14) :** Study the information given in this question to answer them.

**Number of the voters registered and voted from different constituency**

Constituency	Number of voters in thousands	
	Registered	Voted
I	180	105
II	250	150
III	290	170
IV	320	200
V	200	110

14. Which constituency had the lowest percentage of polling?
  - A. I
  - B. V
  - C. III
  - D. IV
15. The least number of complete years, in which a sum of money put out at 20% compound interest compounded annually will be more than double, is:
  - A. 3
  - B. 4
  - C. 5
  - D. 6

**Directions (Qs. No. 16 to 20) :** Answer the questions on the basis of information given below.

A tournament is organized among five teams Ahmedabad, Bombay, Calcutta, Delhi and England. This is a round robin league tournament where each team has to play every other team exactly once. For any team, three points are awarded for a win, one point for a draw and no point for a loss.

The following table is incomplete even after the end of the tournament.

TEAM	W	D	L	P (Total Point)
Ahmedabad				7
Bombay				2
Calcutta				1
Delhi				10
England				7

Where

- W = Number of matches won
- L = Number of matches lost
- D = Number of matches drawn
- P = Total Points

16. Which team/s did Ahmedabad beat?  
 A. Only Delhi and England  
 B. Only Delhi  
 C. Only Bombay and Calcutta  
 D. Only Bombay and England
17. Which team/s drew the match with Bombay?  
 A. Only Ahmedabad  
 B. Only Calcutta and Delhi  
 C. Only Delhi and England  
 D. Only England
18. Which team had the highest number of draw?  
 A. Bombay                      B. Ahmedabad  
 C. Calcutta                     D. Delhi
19. Which of the following team/s did team England beat?  
 A. Only Delhi  
 B. Only Bombay and Calcutta  
 C. Only Ahmedabad and Delhi  
 D. Only Ahmedabad and Bombay
20. Team England drew match with:  
 A. Only Calcutta and Delhi  
 B. Only Ahmedabad  
 C. Only Bombay  
 D. Only Bombay and Calcutta
21. S is the mid-point of the side QR of the triangle PQR and T is the mid point of QS. If O is the mid point of PT, then area of  $\Delta QOT$  is equal to:  
 A.  $1/2$  area of  $\Delta PQR$   
 B.  $1/4$  area of  $\Delta PQR$   
 C.  $1/6$  area of  $\Delta PQR$   
 D.  $1/8$  area of  $\Delta PQR$
22. The positive square root of  $(\sqrt{48} - \sqrt{45})$  is:  
 A.  $\frac{\sqrt[4]{3}}{2}(\sqrt{5} - \sqrt{3})$       B.  $\frac{\sqrt[4]{3}}{\sqrt{2}}(\sqrt{5} - \sqrt{3})$   
 C.  $\frac{\sqrt{2}}{\sqrt[4]{3}}(\sqrt{5} - \sqrt{3})$       D.  $\frac{\sqrt{2}}{\sqrt[4]{3}}(\sqrt{5} + \sqrt{3})$
23. Which of the following was used as a chemical weapon in the First World War?  
 A. Mustard gas              B. Water gas  
 C. Hydrogen cyanide      D. Carbon monoxide
24. What is the full form of the term 'NPA' as used in banking environment?  
 A. Not Profitable Assets  
 B. Net Performing Assets  
 C. Non Performing Assets  
 D. New Potential Accounts
25. The expected energy of electrons at absolute zero is called:  
 A. Work function      B. Potential energy  
 C. Emission energy    D. Fermi energy
26. One Kilo byte represents:  
 A. 1024 bytes              B. 1000 bytes  
 C. 100 bytes                D. 1064 bytes
27. Creation of MUDRA bank was proposed in the recent budget proposal of the Government of India. MUDRA stands for:  
 A. Monetary Union Development Repay agency  
 B. Medium Units Development & Reconstruction Agency  
 C. Micro Units Development Refinance Agency  
 D. Multipurpose Undertakings Development Refinance Agency
28. The position of how many letters in the word BRAKES remains unchanged when they are arranged in alphabetical order?  
 A. 1                              B. 3  
 C. 2                              D. None of these
29. In a row of 16 boys, when Ashish was shifted two places towards the left, he became 7th from left end. What was his earlier position from the right end of the row?  
 A. 10th                        B. 12th  
 C. 9th                            D. 8th
30. A metallic sphere is melted and is cast into a solid cylinder. If the radius of the base of the cylinder is equal to the radius of the sphere, then the ratio of the surface area of the sphere to the total surface area of the cylinder is?  
 A. 1 : 1                        B. 7 : 8  
 C. 6 : 7                        D. 7 : 5

31. The total cost price of two items is ₹ 10,200 and their selling prices are equal. If one of the two items is sold at a loss of 12% and another is sold at a loss of 18%, then the cost price of the item which is sold at a loss of 18% is:  
 A. ₹ 5280                      B. ₹ 4920  
 C. ₹ 5820                      D. None of these
32. A petrol tank at a filling station has a capacity of 400 litres. The attendant sells 40 litres of petrol from the tank to one customer and then replenishes it with kerosene oil. This process is repeated with six customers. What quantity of pure petrol will the seventh customer get when he purchases 40 litres of petrol?  
 A. 20.50 litres                B. 20.25 litres  
 C. 21.25 litres                D. None of these
33. A and B are two alloys of gold and copper prepared by mixing metals in the ratios 5 : 3 and 5 : 11 respectively. Equal quantities of these alloys are melted to form a third alloy C. The ratio of gold and copper in the alloy C is:  
 A. 33 : 25                      B. 25 : 33  
 C. 17 : 15                      D. 15 : 17
34. The formula for the number of diagonals in a polygon of  $n$  sides is  $d = \frac{1}{2}[n(n-3)]$ . If the number of diagonals in a polygon is twice as many as the number of sides, what is the number of sides:  
 A. 3                              B. 5  
 C. 7                              D. None of these
35. Peeyush walked 8 kms. west and turned right and walked 3 kms. Then again he turned right and walked 12 kms. How far is he from the starting point?  
 A. 5 kms.                      B. 7 kms.  
 C. 9 kms.                      D. None of these
36. Which one of the following statements correctly describes the Fourth Schedule of the Constitution of India?

- A. It contains the scheme of the distribution of powers between the union and states  
 B. It allocates seats in the council of states  
 C. It contains the languages listed in the constitution  
 D. It contains the provisions regarding the administration of tribal areas

**Directions (Qs. No. 37) :** In the following question two statements are followed by two possible inferences. Point out which of the following answer choice applies. Assume statements to be correct even if they vary from facts.

- (a) Only inference I follows  
 (b) Only inference II follows  
 (c) Both inferences I and II follow  
 (d) Neither inferences I nor II follow

37. All fish are tortoise, no tortoise is a crocodile:  
 I. No crocodile is a fish.  
 II. No fish is a crocodile.  
 A. (a)                              B. (b)  
 C. (c)                              D. (d)
38. When three coins are tossed together, the probability that all coins have the same face is:  
 A. 1/4                              B. 1/6  
 C. 1/3                              D. None of these
39. A man walked diagonally across a square plot. What was the percent saved by not walking along edges?  
 A. 20%                              B. 30%  
 C. 40%                              D. 50%

**Directions (Qs. No. 40) :** In the following question a number series is given. After the series a number is given followed by (a), (b), (c), (d) and (e). You have to complete the series starting with the number given following the sequence of the given series and answer the question given below the series.

40.	6	10	7	12	8	14
	4	(a)	(b)	(c)	(d)	(e)

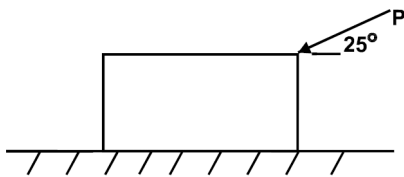
- What will come in place of (d)  
 A. 6                              B. 5  
 C. 8                              D. 9

41. If 1 is coded as R, 2 as T, 3 as Z, 4 as B, 5 as O, 6 as L, 7 as C, 8 as J, 9 as V, which of the following is the coded form of 28147962?  
A. TRJBCVLT      B. TJRBCVLT  
C. TJRCBVLV      D. None of these
42. Five girls are sitting on a bench to be photographed. Sejal is to the left of Rashmi and to the right of Binni. Mamta is to the left of Rashmi. Ragini is between Rashmi and Mamta. Who is sitting immediately right to Ragini?  
A. Rashmi      B. Mamta  
C. Binni      D. Sejal
43. Amar can complete a work in 3 days, Bobby in 4 days and Cheenu in 5 days. If they complete the same work together and get ₹ 14,100 as remuneration, then the share of Cheenu in rupees will be:  
A. ₹ 2800      B. ₹ 3000  
C. ₹ 3200      D. ₹ 3600
44. The work done by a woman in 8 hours is equal to the work done by a man in 6 hours and by a boy in 12 hours. If working 6 hours per day 9 men can complete a work in 6 days, then how many days can 12 men, 12 women and 12 boys together finish the same work working 8 hours per day?  
A.  $1\frac{1}{3}$  days      B.  $3\frac{2}{3}$  days  
C.  $1\frac{1}{2}$  days      D. None of these
45. Who among the following is well known as an exponent of flute?  
A. Madhup Mudgal      B. Shafaat Ahmad  
C. Ronu Mazumdar      D. Debu Choudhari

### KNOWLEDGE OF DISCIPLINE / TRADE

46. Match list-I with List-II and select the correct answer using the codes given below the list:
- | <i>List-I</i><br>(Material properties) | <i>List-II</i><br>(Test to determine properties) |
|--|--|
| (a) Ductility                          | 1. Impact test                                   |
| (b) Toughness                          | 2. Fatigue test                                  |
| (c) Endurance limit                    | 3. Tension test                                  |
| (d) Resistance to penetration          | 4. Hardness test                                 |
- Codes:**  
A. (a)-3, (b)-2, (c)-1, (d)-4  
B. (a)-4, (b)-2, (c)-1, (d)-3  
C. (a)-3, (b)-1, (c)-2, (d)-4  
D. (a)-4, (b)-1, (c)-2, (d)-3
47. Concurrent force system is the system when:  
A. Lines of action of all forces pass through a point  
B. Lines of action of all forces are parallel to each other  
C. Lines of action of all forces lie along same line  
D. Lines of action of all forces are not parallel to each other
48. A couple is formed when:  
A. Two unequal and unlike parallel force acting on a body  
B. Two unequal and like parallel force acting on a body  
C. Two equal and unlike parallel force acting on a body  
D. Two equal and like parallel force acting on a body
49. The total area under the stress-strain curve of a mild steel specimen tested up to failure under tension is a measure of its:  
A. Breaking strength      B. Toughness  
C. Hardness      D. Stiffness
50. Which material has highest value of poisson's ratio?  
A. Elastic Rubber      B. Wood  
C. Copper      D. Steel
51. The motion transmitted between teeth of two spur gears is generally:  
A. Sliding  
B. Rolling  
C. Rotary  
D. Partly sliding and partly rolling

52. The static deflection of a shaft under a flywheel is 4 mm. What is the critical speed in rad/sec if  $g = 10 \text{ m/s}^2$ ?
- A. 50                      B. 20  
C. 10                      D. None of these
53. According to Indian Standard specifications  $50H_7g_6$  means that:
1. Actual size is 50 mm
  2. Tolerance grade for hole is 7
  3. Tolerance grade for shaft is 6
- Which of the statements made above are correct?
- A. 1 and 2                      B. 1, 2 and 3  
C. 2 and 3                      D. None of these
54. A wooden block rests on a horizontal force as shown in figure. The force (P) acting on it at an angle of  $25^\circ$  with horizontal. Assume the mass of block to be 8 kg and coefficient of friction is 0.45.



The force (P) is:

- A. 42.45 N                      B. 49.31 N  
C. 52.21 N                      D. None of these
55. The maximum distortion energy theory of failure is suitable to predict the failure of which one of the following type of materials?
- A. Brittle                      B. Ductile  
C. Composite                      D. Plastics
56. Consider two rods A, B of the same material and subjected to equal axial load. The rod A is of uniform cross-section with diameter  $d$ , and the rod B taper uniformly from diameter  $d$  at one end to diameter  $d/2$  at other end. The ratio of elongation of rod A to elongation of rod B will be:
- A. 1 : 1                      B. 1 : 2  
C. 1 : 3                      D. 1 : 4

57. A Hook's joint is used to connect:
- A. Two parallel shafts  
B. Two intersecting shafts  
C. Two non parallel intersecting shafts  
D. Two non parallel non-intersecting shafts
58. A truss is said to be perfect when it satisfies the following conditions:
- A.  $m = 2j + 3$                       B.  $m = 3j - 2$   
C.  $m = 2j - 3$                       D.  $m = 3j + 2$
59. Enlarging an existing circular hole with a rotating single point tool is called:
- A. Boring                      B. Drilling  
C. Reaming                      D. Internal turning
60. Plug gauge is used to measure:
- A. Shaft size  
B. Hole size  
C. Wire thickness  
D. Depth of threads
61. In order to have interference fit, it is essential that the lower limit of the shaft should be:
- A. Greater than upper limit of the hole  
B. Lesser than upper limit of the hole  
C. Greater than lower limit of the hole  
D. Lesser than lower limit of the hole
62. A steel plate of thermal conductivity 50 W/mK and thickness 10 cm passes a heat flux by conduction of 25 kW/m<sup>2</sup>. If the temperature of hot surface of the plate is 100°C, then what is the temperature of cooler surface of the plate?
- A. 30°C                      B. 40°C  
C. 50°C                      D. None of these
63. Gears are manufactured in mass production by:
- A. Milling                      B. Shaping  
C. Hobbing                      D. Forming
64. In blanking and piercing operation, clearance between die and punch depends on:
- A. Diameter of hole required  
B. Thickness of sheet material  
C. Number of pieces to be made  
D. Capacity and types of press

65. Gate is provided in moulds to:  
 A. Give passage to gases  
 B. Compensate for shrinkage  
 C. Feed the casting at a constant rate  
 D. Avoids cavities
66. The electric resistance welding operates with:  
 A. Low current and high voltage  
 B. High current and low voltage  
 C. Low current and low voltage  
 D. High current and high voltage
67. An orthogonal cutting operation is being carried out under the following conditions  
 Cutting speed ( $V$ ) = 2m/s,  
 depth of cut = 0.5 mm,  
 chip thickness = 0.6 mm  
 Then chip velocity is:  
 A. 2 m/s                      B. 1.66 m/s  
 C. 1 m/s                      D. None of these
68. The rake angle of a cutting tool is  $15^\circ$ , the shear angle is  $45^\circ$  and the cutting velocity is 35 m/min. What is the velocity of chip along the tool face?  
 A. 28.5 m/s                      B. 27.3 m/s  
 C. 25.3 m/s                      D. None of these
69. A 40 mm diameter rod is to be turned on a lathe at a cutting speed of 30 m/min. The required spindle speed should be approximately:  
 A. 120 rpm                      B. 180 rpm  
 C. 240 rpm                      D. None of these
70. A tank containing air is stirred by a paddle wheel. The work input to the paddle wheel is 9000 kJ and heat transferred to the surroundings from the tank is 3000 kJ. The external work done by the system is:  
 A. Zero                      B. 3000 kJ  
 C. 6000 kJ                      D. None of these
71. If the thermal efficiency of a Carnot heat engine is 40%, then Co-efficient of performance of a refrigerator working within same temperature limits would be:  
 A. 4.5                      B. 3.5  
 C. 1.5                      D. None of these
72. A heat engine is supplied with 280 kJ/s of heat at a constant fixed temperature of 520 K and heat rejection takes place at 260 K temperature. If the engine is reversible, the heat rejected would be approximately equal to:  
 A. 85 kJ/s                      B. 110 kJ/s  
 C. 140 kJ/s                      D. None of these
73. An engine operate between temperature limits of 900 K and  $T_2$ , and an other engine operates between  $T_2$  and 400 K. For both engines to be equally efficient,  $T_2$  should be equal to:  
 A. 600 K                      B. 625 K  
 C. 650 K                      D. None of these
74. Two cars A and B move at 54 km/hr in the same direction and the car B is 300 m ahead of car A. If the car A is accelerated at  $6\text{m/s}^2$  while car B continue to move with the same velocity, calculate the time taken by car A to overtake car B:  
 A. 10 s                      B. 20 s  
 C. 15 s                      D. None of these
75. Draft is provided in pattern so that:  
 A. It can be easily withdrawn from mould cavity  
 B. Sand can be filled easily  
 C. Compression can be done effectively  
 D. Casting can be solidifying easily
76. Arc blow is:  
 A. A casting defect    B. A welding defect  
 C. A forging defect    D. A fitting defect
77. A simply supported beam of span  $l$  and carrying uniform distributed load  $W$  per unit length, then maximum bending moment is given by:  
 A.  $Wl^2/2$                       B.  $Wl^2/4$   
 C.  $Wl^2/8$                       D.  $Wl^2/16$
78. In an arc welding:  
 A. Flux is coated on the surface to be welded  
 B. Flux is poured on the surface in the form of powder  
 C. Flux is coated on the electrode  
 D. No flux is used

79. The point of contraflexure in a loaded beam refers to the section where:  
 A. Bending moment is maximum  
 B. Shear force is maximum  
 C. Shear force is zero  
 D. Bending moment change sign
80. Which of the following fitting is a boiler mounting?  
 A. Superheater  
 B. Economizer  
 C. Feed check valve  
 D. Blow down cock
81. Which is not a part of petrol engine?  
 A. Valve mechanism B. Fuel injector  
 C. Induction coil D. Air filter
82. The moment of Inertia of an area is always least with respect to:  
 A. Vertical axis  
 B. Radius of gyration  
 C. Centroidal axis  
 D. None of these
83. During metal cutting operation, it was observed that the chip thickness is 2 mm and the shear angle is  $30^\circ$ . The corresponding length of shear plane is:  
 A. 1 mm B. 2 mm  
 C. 3 mm D. 4 mm
84. If the principle stresses on a plane stress problem are  $S_1 = 100$  MPa and  $S_2 = 40$  MPa, then the magnitude of shear stress (MPa) will be:  
 A. 60 B. 50  
 C. 30 D. None of these
85. A body moves with a speed of 10 m/s in the curved path of 25 m radius of curvature. If the tangential acceleration is  $3 \text{ m/s}^2$ , then total acceleration for the body will be:  
 A.  $3.3 \text{ m/s}^2$  B.  $4 \text{ m/s}^2$   
 C.  $5 \text{ m/s}^2$  D. None of these
86. A Kaplan turbine is suitable for:  
 A. Low head and low discharge  
 B. Low head and high discharge  
 C. High head and low discharge  
 D. High head and high discharge
87. Cavitation in centrifugal pumps can be reduced by:  
 A. Reducing the discharge  
 B. Reducing the suction head  
 C. Throttling the discharge  
 D. Increasing the flow velocity
88. Polar moment of inertia of a hollow shaft having D and  $d$  as outer and inner diameters, is given by:  
 A.  $\frac{\pi}{8}(D^4 - d^4)$  B.  $\frac{\pi}{32}(D^4 - d^4)$   
 C.  $\frac{\pi}{64}(D^4 - d^4)$  D.  $\frac{\pi}{12}(D^4 - d^4)$
89. Two block of weight 50 N and 30 N respectively are connected by a light string passing over a smooth frictionless pulley. The acceleration with which the weights move:  
 A.  $2.25 \text{ m/s}^2$  B.  $2.45 \text{ m/s}^2$   
 C.  $3.05 \text{ m/s}^2$  D. None of these
90. Two shafts whose axes are not in the same straight line and are not parallel but intersect each other. Which of the following couplings can be used for this type of shafts?  
 A. Flexible coupling  
 B. Universal coupling  
 C. Oldham's coupling  
 D. Rigid coupling
91. A bench vice is provided with which type of threads:  
 A. V-Threads  
 B. BSW Threads  
 C. Buttress Threads  
 D. Acme Threads
92. The 'Crowning' of the flat pulley is generally done:  
 A. To reduce the belt friction  
 B. To prevent the belt joint from damaging the belt surface  
 C. To prevent the belt from running off the pulley  
 D. In case of cross belt drive only



- 93.** The thickness of a gear tooth is measured:  
 A. Along the pitch circle  
 B. Along the root circle  
 C. Along the outer circle  
 D. Average of the profile
- 94.** The cycle generally used for petrol engine is:  
 A. Otto cycle            B. Dual cycle  
 C. Carnot cycle        D. Brayton cycle
- 95.** The power transmitted by a circular shaft rotating at N rpm under action of torque T is:  
 A.  $\frac{2\pi NT}{75}$                       B.  $\frac{2\pi NT}{4500}$   
 C.  $\frac{2\pi NT}{650}$                          D. None of these
- 96.** A belt pulley of 200 mm diameter such that the ratio of tension in tight side and slack side is 1.2. The maximum tension in the belt not to exceed 240 kN. Speed of the pulley is 60 rpm. Find the safe power that can be transmitted by the pulley:  
 A. 25.13 W                      B. 26.41 W  
 C. 24.2 W                        D. None of these
- 97.** The resultant upward pressure of a fluid on a floating body is equal to the weight of the fluid displaced by the body. This is known as:  
 A. Pascal law  
 B. Buoyancy force  
 C. Specific gravity of liquid  
 D. Viscosity of liquid
- 98.** A point 20 mm below HP and 30 mm behind VP, Its top view will be:  
 A. 20 mm below XY  
 B. 30 mm below XY  
 C. 20 mm above XY  
 D. 30 mm above XY
- 99.** Which of the following welding method uses a pool of molten metal?  
 A. Carbon arc welding  
 B. Submerged arc welding  
 C. TIG arc welding  
 D. MIG arc welding
- 100.** A hacksaw blade cuts on the:  
 A. Forward stroke  
 B. Return stroke  
 C. Both forward and return stroke  
 D. None of these
- 101.** Sand acquires a predetermined shape under pressure and retains the same when pressure is removed. This is due to the property of sand known as:  
 A. Plasticity  
 B. Cohesiveness  
 C. Refractoriness  
 D. Adhesiveness
- 102.** The size of the lathe is expressed as:  
 A. Gross weight of the lathe  
 B. Diameter of the chuck  
 C. Maximum speed of the chuck  
 D. Swing of the lathe
- 103.** The resistance per unit area, offered by a body against deformation is known as:  
 A. Load                         B. Pressure  
 C. Stress                        D. Strain
- 104.** The heat engine that operates the most efficiently between a high-temperature reservoir and a low-temperature reservoir is the:  
 A. Carnot Engine  
 B. C.I. Engine  
 C. S.I. Engine  
 D. Gas Turbine Engine
- 105.** The cycle generally used for gas turbines is:  
 A. Otto cycle  
 B. Brayton cycle  
 C. Carnot cycle  
 D. Dual cycle
- 106.** Relation between number of links (I) and number of pairs (P) is:  
 A.  $I = 2P - 2$                       B.  $I = 2P - 3$   
 C.  $I = 2P - 4$                       D. None of these
- 107.** In centre less grinding, work piece is clamped in:  
 A. Bed                              B. Vice  
 C. Chuck                         D. Collet

- 108.** Which of the following measuring device is used for measuring the rate of flow of a fluid flowing through a pipe:  
 A. Venturi meter  
 B. Orifice meter  
 C. Pitot tube  
 D. All of these
- 109.** In a refrigeration cycle the heat is absorbed by refrigerant at:  
 A. Evaporator  
 B. Condenser  
 C. Expansion valve  
 D. Compressor
- 110.** Effort required at the circumference of the screw jack to lift the load (W) is given by:  
 A.  $W \tan (\alpha - \phi)$     B.  $W \tan (\phi - \alpha)$   
 C.  $W \tan (\alpha + \phi)$     D. None of these
- 111.** On a ladder resting on a smooth ground and leaning against vertical wall, the force of friction will be:  
 A. Away from the wall at its upper end  
 B. Towards the wall at its upper end  
 C. Upwards at its upper end  
 D. Downwards at its upper end
- 112.** For a given steam temperature of  $850^{\circ}\text{C}$  and vacuum of  $0.1 \text{ kg/cm}^2$  absolute, the Rankine cycle efficiency will be maximum when steam pressure is:  
 A.  $100 \text{ kg/cm}^2$   
 B.  $200 \text{ kg/cm}^2$   
 C. Critical pressure ( $225.4 \text{ kg/cm}^2$ )  
 D.  $350 \text{ kg/cm}^2$
- 113.** In a two-fluid heat exchanger, the inlet and outlet temperature of the hot fluid are  $65^{\circ}\text{C}$  and  $40^{\circ}\text{C}$  respectively. For the cold fluid, these are  $15^{\circ}\text{C}$  and  $42^{\circ}\text{C}$ . The heat exchanger is a:  
 A. Parallel flow heat exchanger  
 B. Counter flow heat exchanger  
 C. Heat exchange device where both parallel flow and counter flow operations are possible  
 D. None of the above
- 114.** The conditions for the stable equilibrium of a floating body are:  
 A. The meta-centre should lie above the centre of gravity  
 B. The centre of buoyancy and the centre of gravity must lie on the same vertical line  
 C. A righting couple should be formed  
 D. All the above are correct
- 115.** Generally least count of the commonly used vernier is:  
 A.  $0.1 \text{ mm}$                       B.  $0.01 \text{ mm}$   
 C.  $0.02 \text{ mm}$                       D.  $0.2 \text{ mm}$
- 116.** If a ball which is dropped from a height of  $2.25 \text{ m}$  on a smooth floor attains the height of bounce equal to  $1.00 \text{ m}$ , the coefficient of the restitution between the ball and the floor is equal to:  
 A.  $0.25$                               B.  $0.50$   
 C.  $0.67$                               D.  $0.33$
- 117.** A spherical vessel with an inside diameter of  $2 \text{ m}$  is made of material having an allowable stress in tension of  $500 \text{ kg/cm}^2$ . The thickness of a shell to withstand a pressure of  $25 \text{ kg/cm}^2$  should be:  
 A.  $5 \text{ cm}$                               B.  $10 \text{ cm}$   
 C.  $2.5 \text{ cm}$                             D.  $1.25 \text{ cm}$
- 118.** Choose the correct statement:  
 A. An adiabatic process is always reversible  
 B. An isentropic process is never reversible  
 C. An adiabatic process is always isentropic  
 D. A frictionless adiabatic process is always isentropic
- 119.** A pump delivers water at a rate of  $0.025 \text{ m}^3/\text{s}$  against a head of  $30 \text{ m}$ . If the overall efficiency of the pump is  $75\%$ , the power required by the pump is:  
 A.  $1 \text{ kW}$                               B.  $4.9 \text{ kW}$   
 C.  $7.8 \text{ kW}$                             D.  $9.8 \text{ kW}$
- 120.** Morse test is carried out to determine ..... of an engine:  
 A. I.H.P.  
 B. F.H.P.  
 C. B.H.P.  
 D. Efficiency

<b>ANSWERS</b>
----------------

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
C	B	A	C	B	D	A	C	A	D
<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
B	A	D	B	B	C	B	A	B	B
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
D	B	A	C	D	A	C	C	D	C
<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
A	C	D	C	A	B	C	A	B	A
<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
B	A	D	C	C	C	A	C	D	A
<b>51</b>	<b>52</b>	<b>53</b>	<b>54</b>	<b>55</b>	<b>56</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>60</b>
D	A	C	B	B	B	C	C	A	B
<b>61</b>	<b>62</b>	<b>63</b>	<b>64</b>	<b>65</b>	<b>66</b>	<b>67</b>	<b>68</b>	<b>69</b>	<b>70</b>
A	C	C	B	C	B	B	A	C	A
<b>71</b>	<b>72</b>	<b>73</b>	<b>74</b>	<b>75</b>	<b>76</b>	<b>77</b>	<b>78</b>	<b>79</b>	<b>80</b>
C	C	A	A	A	B	C	C	D	C
<b>81</b>	<b>82</b>	<b>83</b>	<b>84</b>	<b>85</b>	<b>86</b>	<b>87</b>	<b>88</b>	<b>89</b>	<b>90</b>
B	C	D	C	C	B	B	B	B	B
<b>91</b>	<b>92</b>	<b>93</b>	<b>94</b>	<b>95</b>	<b>96</b>	<b>97</b>	<b>98</b>	<b>99</b>	<b>100</b>
D	C	A	A	B	A	B	D	B	A
<b>101</b>	<b>102</b>	<b>103</b>	<b>104</b>	<b>105</b>	<b>106</b>	<b>107</b>	<b>108</b>	<b>109</b>	<b>110</b>
A	D	C	A	B	C	D	D	A	C
<b>111</b>	<b>112</b>	<b>113</b>	<b>114</b>	<b>115</b>	<b>116</b>	<b>117</b>	<b>118</b>	<b>119</b>	<b>120</b>
C	D	B	D	C	C	C	D	D	A

---