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सतीश धवन अंतरिक्ष केंद्र शार, श्रीहरिकोटा

भारतीय अंतरिक्ष अनुसंधान संगठन  
Indian Space Research Organisation



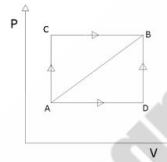
**SATISH DHAWAN SPACE CENTRE SHAR**  
Sriharikota

Participant ID	
Participant Name	
Test Center Name	
Test Date	14/02/2024
Test Time	12:30 PM - 2:00 PM
Subject	Technical Assistant Mechanical Engineering

Section : Curriculum Based

**Q.1** When a system is taken from State A to State B along path A-C-B 180KJ of heat flows in to the system and it does 130KJ of work. How much Heat will flow in to the system along the path A-D-B if work done by it along the path is 40KJ?

- A. 40KJ
- B. 60KJ
- C. 90KJ
- D. 140KJ



- Ans**
- A. A
  - B. B
  - C. C
  - D. D



Question ID : 4025574262  
Option 1 ID : 40255717045  
Option 2 ID : 40255717046  
Option 3 ID : 40255717047  
Option 4 ID : 40255717048  
Status : Answered  
Chosen Option : C

**Q.2** Determine the bulk modulus of elasticity of a liquid, if the pressure of the Liquid is increased from  $70\text{N/cm}^2$  to  $130\text{N/cm}^2$ . The volume of liquid decreases by 0.15 percent.

- A.  $4 \times 10^4\text{N/cm}^2$
- B.  $0.4 \times 10^4\text{N/cm}^2$
- C.  $40 \times 10^4\text{N/cm}^2$
- D.  $4 \times 10^4\text{N/mm}^2$

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574309  
Option 1 ID : 40255717233  
Option 2 ID : 40255717234  
Option 3 ID : 40255717235  
Option 4 ID : 40255717236  
Status : Answered  
Chosen Option : B

**Q.3** In a system of pulleys of the first type there are three pulleys and a weight of 320 N can just be supported by an effort of 50 N. Find the efficiency of the machine.

- A. 70%
- B. 60%
- C. 50%
- D. 80%

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574268  
Option 1 ID : 40255717069  
Option 2 ID : 40255717070  
Option 3 ID : 40255717071  
Option 4 ID : 40255717072  
Status : Not Answered  
Chosen Option : --



Q.4 The core diameter of ISO metric V-thread is 84mm then its nominal diameter is

- A. 80mm
- B. 84mm
- C. 100 mm
- D. 70.56 mm

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574271  
Option 1 ID : 40255717081  
Option 2 ID : 40255717082  
Option 3 ID : 40255717083  
Option 4 ID : 40255717084  
Status : Not Answered  
Chosen Option : --

Q.5 Hardenability of steel is commonly measured by

- A. Eddy current test
- B. Vickers hardness test
- C. Jominy end quench test
- D. Izod impact test

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574306  
Option 1 ID : 40255717221  
Option 2 ID : 40255717222  
Option 3 ID : 40255717223  
Option 4 ID : 40255717224  
Status : Answered  
Chosen Option : B

Q.6  $\int \frac{1}{1-\sin x} dx$

A.  $\tan x + \sec x + c$

B.  $\tan x - \sec x + c$

C.  $\tan x - \cot x + c$

D.  $\tan x + \cot x + c$

Ans  A. A

B. B

C. C

D. D

Question ID : 4025574283  
Option 1 ID : 40255717129  
Option 2 ID : 40255717130  
Option 3 ID : 40255717131  
Option 4 ID : 40255717132  
Status : Answered  
Chosen Option : B

Q.7 What type of motors are used in lathes?

A. AC induction motors

B. AC squirrel cage motors

C. DC Shunt motors

D. DC Series motors

Ans  A. A

B. B

C. C

D. D

Question ID : 4025574291  
Option 1 ID : 40255717161  
Option 2 ID : 40255717162  
Option 3 ID : 40255717163  
Option 4 ID : 40255717164  
Status : Answered  
Chosen Option : A

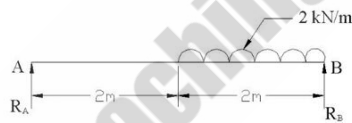
Q.8 Furnace used for production of cast iron by melting pig iron is

- A. Blast furnace
- B. Cupola furnace
- C. Open hearth furnace
- D. Pit furnace

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574248  
Option 1 ID : 40255716989  
Option 2 ID : 40255716990  
Option 3 ID : 40255716991  
Option 4 ID : 40255716992  
Status : Answered  
Chosen Option : B

Q.9 A simply supported beam is loaded as shown in the following figure, find the value of  $R_A$



- A. 1 kN
- B. 3 kN
- C. 2 kN
- D. 4 kN

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574302  
Option 1 ID : 40255717205  
Option 2 ID : 40255717206  
Option 3 ID : 40255717207  
Option 4 ID : 40255717208  
Status : Answered  
Chosen Option : A

Q.10 Energy is added to 5kg of air with a paddle wheel so that change in temperature is 100 K while Pressure remaining constant in an insulated container. Calculate the paddle work.

Take  $C_p$  of air = 1KJ/kg.K ,  $C_v$  of air = 0.707KJ/kg.K

- A. +500KJ
- B. -500KJ
- C. 482KJ
- D. 412KJ

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574261  
Option 1 ID : 40255717041  
Option 2 ID : 40255717042  
Option 3 ID : 40255717043  
Option 4 ID : 40255717044  
Status : Answered  
Chosen Option : A

Q.11 Which of the following is also known as Carboic acid?

- A. Ethanol
- B. Phenol
- C. Hydroxide
- D. Sulphuric acid

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574288  
Option 1 ID : 40255717149  
Option 2 ID : 40255717150  
Option 3 ID : 40255717151  
Option 4 ID : 40255717152  
Status : Not Answered  
Chosen Option : --

Q.12 A cargo is declared as Over Dimensioned Cargo, if its width is more than\_\_\_\_\_

- A. 3.5 m
- B. 2.6 m
- C. 4.1 m
- D. 12 m

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574290  
Option 1 ID : 40255717157  
Option 2 ID : 40255717158  
Option 3 ID : 40255717159  
Option 4 ID : 40255717160  
Status : Not Answered  
Chosen Option : --

Q.13 When a shaft rotates in anticlockwise direction at slow speed in a bearing, then it will

- A. have contact at the lowest point of bearing
- B. move towards right of the bearing making metal to metal contact
- C. move towards left of the bearing making metal to metal contact
- D. none of the above

Ans  A. A  
 B. B  
 C. C  
 D. D



Question ID : 4025574273  
Option 1 ID : 40255717089  
Option 2 ID : 40255717090  
Option 3 ID : 40255717091  
Option 4 ID : 40255717092  
Status : Answered  
Chosen Option : B



Q.14 A tapering bar diameters of end sections being  $d_1$  &  $d_2$  and a bar of uniform cross section  $d$  have the same length and are subjected the same axial pull. Both the bars will have the same extension if  $d$  is equal to

- A.  $(d_1+d_2)/2$
- B.  $\sqrt{d_1d_2}$
- C.  $\sqrt{(d_1d_2)/2}$
- D.  $\sqrt{(d_1+d_2)/2}$

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574305  
Option 1 ID : 40255717217  
Option 2 ID : 40255717218  
Option 3 ID : 40255717219  
Option 4 ID : 40255717220  
Status : Answered  
Chosen Option : B

Q.15 The provision of taper on vertical faces of mould pattern is called as

- A. Rapping
- B. Core
- C. Draft
- D. Fettling

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574242  
Option 1 ID : 40255716965  
Option 2 ID : 40255716966  
Option 3 ID : 40255716967  
Option 4 ID : 40255716968  
Status : Answered  
Chosen Option : C

**Q.16** If A (4,1, p), B (1, q, p), C (1, 2, -3) are vertices of triangle and G( $r, 4/3, 1/3$ ) is its centroid, then find the values of p, q & r

- A. 2,1,2
- B. 2,1, -2
- C. 2, -1, -2
- D. -2,1, -2

**Ans**  A. A

B. B

C. C

D. D

Question ID : 4025574319

Option 1 ID : 40255717273

Option 2 ID : 40255717274

Option 3 ID : 40255717275

Option 4 ID : 40255717276

Status : Answered

Chosen Option : A

**Q.17** A Horizontal venturimeter with Inlet diameter 20cm and throat diameter 10cm used to measure the flow of water. The pressure at inlet is  $17.658\text{N/cm}^2$  and the vacuum pressure at the throat is 30cm of mercury. Find the differential head of water in m.

- A. 32m
- B. 22m
- C. 2.2m
- D. 3.2m

**Ans**  A. A

B. B

C. C

D. D

Question ID : 4025574264

Option 1 ID : 40255717053

Option 2 ID : 40255717054

Option 3 ID : 40255717055

Option 4 ID : 40255717056

Status : Not Answered

Chosen Option : --

Q.18 During cooling of pure iron from melting point to room temperature, crystal structure changes from

- A. BCC to FCC
- B. BCC to FCC and then to BCC
- C. FCC to BCC
- D. FCC to BCC and then to FCC

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574292  
Option 1 ID : 40255717165  
Option 2 ID : 40255717166  
Option 3 ID : 40255717167  
Option 4 ID : 40255717168  
Status : Answered  
Chosen Option : B

Q.19 Euler's number is the ratio of

- A. Inertia force to pressure force
- B. Inertia force to elastic force
- C. Inertia force to gravity force
- D. Pressure force to elastic force

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574258  
Option 1 ID : 40255717029  
Option 2 ID : 40255717030  
Option 3 ID : 40255717031  
Option 4 ID : 40255717032  
Status : Answered  
Chosen Option : A

Q.20 Match the following.

- |   |                     |
|---|---------------------|
| M. Work piece rotates & cutting tool travels axially along the length of work piece,          | 1. Shaping machine  |
| N. Work piece is held stationary, cutting tool reciprocates horizontally over the work piece. | 2. Lathe machine    |
| O. Work piece is held stationary & cutting tool reciprocates in vertical axis                 | 3. Planing machine  |
| P. Work piece reciprocates past the stationary cutting tool                                   | 4. Slotting machine |

- Options:
- |    |    |    |    |    |
|----|----|----|----|----|
| A. | M2 | N3 | O4 | P1 |
| B. | M2 | N1 | O4 | P3 |
| C. | M2 | N3 | O1 | P4 |
| D. | M2 | N1 | O3 | P4 |

- Ans
- A. A
  - B. B
  - C. C
  - D. D

Question ID : 4025574245  
Option 1 ID : 40255716977  
Option 2 ID : 40255716978  
Option 3 ID : 40255716979  
Option 4 ID : 40255716980  
Status : Answered  
Chosen Option : B

Q.21 Expansion in a nozzle is a

- A. Isobaric process
- B. Isothermal process
- C. Adiabatic process
- D. Parabolic process

- Ans
- A. A
  - B. B
  - C. C
  - D. D

Question ID : 4025574259  
Option 1 ID : 40255717033  
Option 2 ID : 40255717034  
Option 3 ID : 40255717035  
Option 4 ID : 40255717036  
Status : Answered  
Chosen Option : C

Q.22 Which of the following statement is False about Cast Iron?

- A. Contains more than 2% Carbon
- B. Excellent machinability
- C. Compressive strength is lesser than Tensile strength
- D. Good casting properties.

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574250  
Option 1 ID : 40255716997  
Option 2 ID : 40255716998  
Option 3 ID : 40255716999  
Option 4 ID : 40255717000  
Status : Answered  
Chosen Option : C

Q.23 Chemical formula of washing soda

- A.  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$
- B.  $\text{Na HCO}_3 \cdot \text{H}_2\text{O}$
- C.  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
- D.  $\text{Na HCO}_3 \cdot 10 \text{H}_2\text{O}$

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574313  
Option 1 ID : 40255717249  
Option 2 ID : 40255717250  
Option 3 ID : 40255717251  
Option 4 ID : 40255717252  
Status : Answered  
Chosen Option : D

Q.24 What is “Eutectic temperature” of a brine solution?

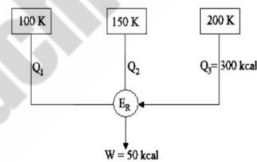
- A. Temperature at which the solution evaporates
- B. Temperature at which the solution freezes
- C. Temperature at which the solution starts bubbling and losing the properties
- D. Temperature of Triple point of the water used

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574317  
Option 1 ID : 40255717265  
Option 2 ID : 40255717266  
Option 3 ID : 40255717267  
Option 4 ID : 40255717268  
Status : Answered  
Chosen Option : C

Q.25 A Reversible engine as shown in the given figure draws 300kcal from 200K reservoir and does 50kcal of work during a cycle. The sum of heat interactions with the other two reservoirs is given by

- A.  $Q_1 + Q_2 = + 250\text{kcal}$
- B.  $Q_1 + Q_2 = - 250\text{kcal}$
- C.  $Q_1 + Q_2 = + 350\text{kcal}$
- D.  $Q_1 + Q_2 = - 250\text{kcal}$



Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574263  
Option 1 ID : 40255717049  
Option 2 ID : 40255717050  
Option 3 ID : 40255717051  
Option 4 ID : 40255717052  
Status : Answered  
Chosen Option : B

Q.26 The ratio of isometric length to actual length is

- A. 0.816
- B. 0.0816
- C. 8.16
- D. 0.5

Ans  A. A

B. B

C. C

D. D

Question ID : 4025574279

Option 1 ID : 40255717113

Option 2 ID : 40255717114

Option 3 ID : 40255717115

Option 4 ID : 40255717116

Status : Answered

Chosen Option : A

Q.27 In surface grinding operation, grinding wheel of dia.60mm is rotating at 700 rpm. Power consumed is given as 2.2kW. Cutting force acting tangential to grinding wheel is

- A. 1000 N
- B. 1504 N
- C. 2200 N
- D. 2200 N

Ans  A. A

B. B

C. C

D. D

Question ID : 4025574297

Option 1 ID : 40255717185

Option 2 ID : 40255717186

Option 3 ID : 40255717187

Option 4 ID : 40255717188

Status : Answered

Chosen Option : A

Q.28

Control chart for attribute is

- A. P chart
- B. X bar chart
- C. R chart
- D. Y chart

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574280  
Option 1 ID : 40255717117  
Option 2 ID : 40255717118  
Option 3 ID : 40255717119  
Option 4 ID : 40255717120  
Status : Answered  
Chosen Option : A

Q.29 The eccentricity of which of the following curve is greater than 1

- A. Ellipse
- B. Parabola
- C. Hyperbola
- D. Circle

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574294  
Option 1 ID : 40255717173  
Option 2 ID : 40255717174  
Option 3 ID : 40255717175  
Option 4 ID : 40255717176  
Status : Answered  
Chosen Option : A



Q.30 Which of the following operation cannot be done on lathe?

- A. Drilling of hole along the length of axis of work piece
- B. Drilling of hole perpendicular to the axis of work piece
- C. External taper turning
- D. Internal thread cutting

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574243  
Option 1 ID : 40255716969  
Option 2 ID : 40255716970  
Option 3 ID : 40255716971  
Option 4 ID : 40255716972  
Status : Answered  
Chosen Option : B

Q.31 Product layout is employed for

- A. Batch production
- B. Effective utilisation of the machine
- C. Intermittent production
- D. Continuous production

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574281  
Option 1 ID : 40255717121  
Option 2 ID : 40255717122  
Option 3 ID : 40255717123  
Option 4 ID : 40255717124  
Status : Answered  
Chosen Option : A

Q.32 The amount of pearlite and cementite present in 1.1% carbon steel at room temperature under slowly cooled conditions

- A. Pearlite: 95% & Cementite:5%
- B. Pearlite: 84.5% & Cementite:15.5%
- C. Pearlite: 80% & Cementite:20%
- D. Pearlite: 90.5% & Cementite:9.5%

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574252  
Option 1 ID : 40255717005  
Option 2 ID : 40255717006  
Option 3 ID : 40255717007  
Option 4 ID : 40255717008  
Status : Not Answered  
Chosen Option : --

Q.33 The relationship between Cutting speed V and tool life T is given by  $VT^n = C$ . With  $n=0.5$  and  $C=120$ , the percentage increase in tool life when cutting speed is reduced by 50%

- A. 120
- B. 200
- C. 300
- D. 350

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574246  
Option 1 ID : 40255716981  
Option 2 ID : 40255716982  
Option 3 ID : 40255716983  
Option 4 ID : 40255716984  
Status : Answered  
Chosen Option : C

Q.34 Ball and socket joint forms a

- A. Turning pair
- B. Spherical pair
- C. Rolling pair
- D. Sliding pair

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574253  
Option 1 ID : 40255717009  
Option 2 ID : 40255717010  
Option 3 ID : 40255717011  
Option 4 ID : 40255717012  
Status : Answered  
Chosen Option : B

Q.35 An Engine operates between temperature limits at 900K and  $T_2$  and another between  $T_2$  and 400K. What is the value of  $T_2$  if work output of both engines are equal?

- A. 600K
- B. 650K
- C. 625K
- D. 750K

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574303  
Option 1 ID : 40255717209  
Option 2 ID : 40255717210  
Option 3 ID : 40255717211  
Option 4 ID : 40255717212  
Status : Answered  
Chosen Option : B

**Q.36** A sample of fuel with 90% carbon, 5% hydrogen, 4% Oxygen and remaining ash is burnt in a furnace with 33.33% excess air find the mass of air supplied per kg of fuel

- A. 12 kg
- B. 16 kg
- C. 9 kg
- D. 6 kg

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574287  
Option 1 ID : 40255717145  
Option 2 ID : 40255717146  
Option 3 ID : 40255717147  
Option 4 ID : 40255717148  
Status : Not Answered  
Chosen Option : --

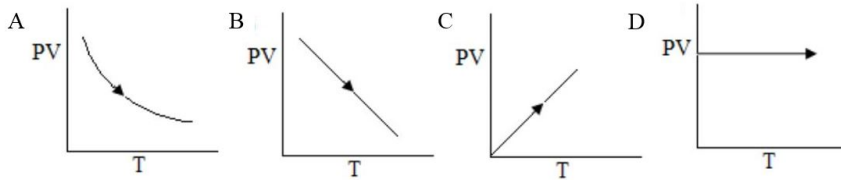
**Q.37** In a multiple disc clutch, if there are 6 discs on the driving shaft and 5 discs on the driven shaft, then the number of pairs of contact surfaces will be equal to

- A. 11
- B. 12
- C. 10
- D. 22

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574301  
Option 1 ID : 40255717201  
Option 2 ID : 40255717202  
Option 3 ID : 40255717203  
Option 4 ID : 40255717204  
Status : Answered  
Chosen Option : C

Q.38 Which one of the following PV-T diagrams correctly represents the properties of an ideal gas



- Ans
- A. A
  - B. B
  - C. C
  - D. D

Question ID : 4025574260  
Option 1 ID : 40255717037  
Option 2 ID : 40255717038  
Option 3 ID : 40255717039  
Option 4 ID : 40255717040  
Status : Answered  
Chosen Option : C

Q.39 If a ball bearing is designated by the number 208, then the bore of the bearing is equal to

- A. 40mm
- B. 32mm
- C. 24mm
- D. 16mm

- Ans
- A. A
  - B. B
  - C. C
  - D. D

Question ID : 4025574299  
Option 1 ID : 40255717193  
Option 2 ID : 40255717194  
Option 3 ID : 40255717195  
Option 4 ID : 40255717196  
Status : Answered  
Chosen Option : A

Q.40 Sting of ants and bees comprises which of the following acid

- A. Lactic acid
- B. Acetic acid
- C. Formic acid
- D. Malathionic acid

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574311  
Option 1 ID : 40255717241  
Option 2 ID : 40255717242  
Option 3 ID : 40255717243  
Option 4 ID : 40255717244  
Status : Answered  
Chosen Option : C

Q.41

← 20 → This dimensioning system represents the following

- A. Aligned system
- B. Unidirectional system
- C. Chain dimensioning
- D. Parallel dimensioning

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574277  
Option 1 ID : 40255717105  
Option 2 ID : 40255717106  
Option 3 ID : 40255717107  
Option 4 ID : 40255717108  
Status : Answered  
Chosen Option : A

Q.42 A flat foot step bearing 300mm diameter supports a load of 25kN. If the coefficient of friction is 0.05 and the speed 60 rpm. Calculate the power lost at the bearing.

- A.  $\pi$  150 W
- B.  $\pi$  300 W
- C.  $\pi$  450 W
- D.  $\pi$  500 W

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574275  
Option 1 ID : 40255717097  
Option 2 ID : 40255717098  
Option 3 ID : 40255717099  
Option 4 ID : 40255717100  
Status : Answered  
Chosen Option : C

Q.43 In a cantilever beam, irrespective of the type of loading, maximum bending moment occurs at.

- A. Free end
- B. Under the load
- C. Fixed end
- D. Middle

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574265  
Option 1 ID : 40255717057  
Option 2 ID : 40255717058  
Option 3 ID : 40255717059  
Option 4 ID : 40255717060  
Status : Answered  
Chosen Option : C

Q.44 Find the time period of a body of mass 10 gm executing Simple Harmonic Motion under the restoring force of 400N/m

- A.  $40/\pi$  sec
- B.  $100 \pi$  sec
- C.  $40\pi$  sec
- D.  $\pi/100$  sec

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574285  
Option 1 ID : 40255717137  
Option 2 ID : 40255717138  
Option 3 ID : 40255717139  
Option 4 ID : 40255717140  
Status : Answered  
Chosen Option : C

Q.45 Water having kinematic viscosity  $\sigma$  of 0.01 stoke flows at a velocity of 2m/sec in a pipeline of 15cm diameter. For dynamic similarity, the velocity of oil of kinematic viscosity 0.03 stoke in a pipeline of same diameter will be

- A. 0.33m/sec
- B. 0.66m/sec
- C. 2m/sec
- D. 6m/sec

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574310  
Option 1 ID : 40255717237  
Option 2 ID : 40255717238  
Option 3 ID : 40255717239  
Option 4 ID : 40255717240  
Status : Not Answered  
Chosen Option : --



**Q.46** A stone is thrown vertically upwards with a velocity of 20 m/s. At the same instant a ball is dropped from a point directly above the stone from a height of 40 m. At what height the stone & ball will meet and after how much time

- A. 15 m & 1 sec
- B. 5 m & 2 sec
- C. 20 m & 2 sec
- D. 20 m & 1 sec

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574314  
Option 1 ID : 40255717253  
Option 2 ID : 40255717254  
Option 3 ID : 40255717255  
Option 4 ID : 40255717256  
Status : Not Answered  
Chosen Option : --

**Q.47** Which of the following is a quick Silver?

- A. Aluminium
- B. Lead
- C. Zinc
- D. Mercury

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574286  
Option 1 ID : 40255717141  
Option 2 ID : 40255717142  
Option 3 ID : 40255717143  
Option 4 ID : 40255717144  
Status : Answered  
Chosen Option : D

Q.48

Find the value of  $\frac{1}{\cot 2A + \tan A}$

- A.  $2\cos^2 A - \sin^2 A$
- B.  $\cos^2 A - 2\sin^2 A$
- C.  $\sin A \cos A / 2$
- D.  $2\sin A \cos A$

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574282  
Option 1 ID : 40255717125  
Option 2 ID : 40255717126  
Option 3 ID : 40255717127  
Option 4 ID : 40255717128  
Status : Answered  
Chosen Option : A

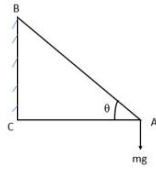
Q.49 In a differential screw jack, pitch of threads is 12mm and 7mm and arm length is 700mm. Effort required to lift a load of 880kN at 50% efficiency is

- A. 2 kN
- B. 6 kN
- C. 4 kN
- D. 5 kN

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574255  
Option 1 ID : 40255717017  
Option 2 ID : 40255717018  
Option 3 ID : 40255717019  
Option 4 ID : 40255717020  
Status : Not Answered  
Chosen Option : --

Q.50 Find the induced force in the member AB from the following free body diagram.



- A)  $mg \tan\theta$
- B)  $mg \sec\theta$
- C)  $mg \sin\theta$
- D)  $mg \csc\theta$

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574270  
Option 1 ID : 40255717077  
Option 2 ID : 40255717078  
Option 3 ID : 40255717079  
Option 4 ID : 40255717080  
Status : Answered  
Chosen Option : D

Q.51  $\int \frac{\cos x}{1-\cos x} \cdot dx$

- A.  $c - \operatorname{cosec} x - \cot x - x$
- B.  $c - \operatorname{cosec} x + \cot x + x$
- C.  $c - \operatorname{cosec} x + \cot x - x$
- D.  $c + \operatorname{cosec} x + \cot x + x$

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574315  
Option 1 ID : 40255717257  
Option 2 ID : 40255717258  
Option 3 ID : 40255717259  
Option 4 ID : 40255717260  
Status : Not Answered  
Chosen Option : --

Q.52

If  $A = \begin{bmatrix} 2 & 1 & 0 \\ 3 & 4 & 5 \end{bmatrix}$ ,  $B = \begin{bmatrix} 3 & 4 & 5 \\ 6 & 3 & 0 \end{bmatrix}$  and  $C = \begin{bmatrix} 4 & 6 & 1 \\ 3 & 1 & 6 \end{bmatrix}$  find the value of  $9A + 16B - 12C$

A.  $\begin{bmatrix} 18 & 1 & 60 \\ 87 & 72 & -72 \end{bmatrix}$

B.  $\begin{bmatrix} 18 & 1 & 68 \\ 87 & 72 & -27 \end{bmatrix}$

C.  $\begin{bmatrix} 48 & 1 & 60 \\ 37 & 62 & -72 \end{bmatrix}$

D.  $\begin{bmatrix} 48 & 1 & 60 \\ 87 & 72 & -27 \end{bmatrix}$

- Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574316  
Option 1 ID : 40255717261  
Option 2 ID : 40255717262  
Option 3 ID : 40255717263  
Option 4 ID : 40255717264  
Status : Not Answered  
Chosen Option : --

Q.53 Two mating spur gears have 80 and 40 teeth. If their common module is 4mm. The centre distance between their axis is

- A. 960 mm  
B. 480mm  
C. 60mm  
D. 240mm

- Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574276  
Option 1 ID : 40255717101  
Option 2 ID : 40255717102  
Option 3 ID : 40255717103  
Option 4 ID : 40255717104  
Status : Answered  
Chosen Option : D

Q.54 Which of the following is not an air-conditioning duct design method?

- A. Velocity method
- B. Equal friction method
- C. Pressure compensation method
- D. Static regain method

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574312  
Option 1 ID : 40255717245  
Option 2 ID : 40255717246  
Option 3 ID : 40255717247  
Option 4 ID : 40255717248  
Status : Answered  
Chosen Option : B

Q.55 An ISO class 7 cleanroom requires 0.5 micron particles to be less than \_\_\_\_\_ per cum

- A. 35200
- B. 352000
- C. 10000
- D. 100000

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574289  
Option 1 ID : 40255717153  
Option 2 ID : 40255717154  
Option 3 ID : 40255717155  
Option 4 ID : 40255717156  
Status : Not Answered  
Chosen Option : --

Q.56 When using the micrometre, a constant measuring pressure can be obtained by using the

- A. Thimble
- B. Spindle
- C. Barrel
- D. Ratchet

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574293  
Option 1 ID : 40255717169  
Option 2 ID : 40255717170  
Option 3 ID : 40255717171  
Option 4 ID : 40255717172  
Status : Answered  
Chosen Option : D

Q.57 What is area of trimmed size with Sheet designation of A1?

- A.1 m<sup>2</sup>
- B. 0.5m<sup>2</sup>
- C.0.25m<sup>2</sup>
- D.0.125m<sup>2</sup>

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574278  
Option 1 ID : 40255717109  
Option 2 ID : 40255717110  
Option 3 ID : 40255717111  
Option 4 ID : 40255717112  
Status : Answered  
Chosen Option : B

**Q.58** A torsion spring of stiffness 225 N-m/rad is twisted through an angle of 4 radians. The strain energy stored in the spring is

- A. 2080 joules
- B. 2010 joules
- C. 1800 joules
- D. 1675 joules

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574256  
Option 1 ID : 40255717021  
Option 2 ID : 40255717022  
Option 3 ID : 40255717023  
Option 4 ID : 40255717024  
Status : Answered  
Chosen Option : C

**Q.59** Frequency of oscillation of simple pendulum depends on

- A. Length
- B. Acceleration due to gravity
- C. A&B
- D. Mass of the bob

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574254  
Option 1 ID : 40255717013  
Option 2 ID : 40255717014  
Option 3 ID : 40255717015  
Option 4 ID : 40255717016  
Status : Answered  
Chosen Option : D

**Q.60** At location-I of a horizontal pipe, the fluid pressure is 32cm and the velocity reads 4cm. The reduction in area at Location-II of the pipe is such that pressure head drops down to zero. Find the ratio of velocity at Location-II to that of Location-I.

- A. 2.5
- B. 3
- C. 2
- D. 1.5

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574295  
Option 1 ID : 40255717177  
Option 2 ID : 40255717178  
Option 3 ID : 40255717179  
Option 4 ID : 40255717180  
Status : Answered  
Chosen Option : A

**Q.61** A 60mm diameter shaft rotating in a journal bearing at an angular velocity of 100rad/s carries a load of 2000N and coefficient of friction between shaft and journal is 0.03. Power transmitted by the shaft is

- A. 270W
- B. 180W
- C. 250W
- D. 271W

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574257  
Option 1 ID : 40255717025  
Option 2 ID : 40255717026  
Option 3 ID : 40255717027  
Option 4 ID : 40255717028  
Status : Answered  
Chosen Option : B



Q.62 Tool used for smooth finishing of drilled holes is

- A. Twist drill
- B. Reamer
- C. Scrapper
- D. Tap

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574241  
Option 1 ID : 40255716961  
Option 2 ID : 40255716962  
Option 3 ID : 40255716963  
Option 4 ID : 40255716964  
Status : Answered  
Chosen Option : B

Q.63 Which of the following metals are generally more ductile?

- A. FCC
- B. BCC
- C. HCP
- D. SC

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574247  
Option 1 ID : 40255716985  
Option 2 ID : 40255716986  
Option 3 ID : 40255716987  
Option 4 ID : 40255716988  
Status : Answered  
Chosen Option : A

- Q.64** In open flat belt drive, the radius of driving and driven pulleys is 500mm and 250mm respectively and center distance between them is 1250mm. Angle of contact of belt on bigger pulley in degrees is
- A.  $180 + 2 \sin^{-1} 0.2$
  - B.  $180 + \sin^{-1} 0.5$
  - C.  $180 - 2 \sin^{-1} 0.6$
  - D.  $180 - \sin^{-1} 0.1$

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574296  
Option 1 ID : 40255717181  
Option 2 ID : 40255717182  
Option 3 ID : 40255717183  
Option 4 ID : 40255717184  
Status : Answered  
Chosen Option : A

- Q.65** A wave of wave length 0.1 cm is produced in air and it travels at a speed of 600m/s what is its frequency and will it be audible
- A. 6000Hz and audible
  - B. 60Hz and audible
  - C. 60000Hz and audible
  - D. 600000Hz and not audible

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574284  
Option 1 ID : 40255717133  
Option 2 ID : 40255717134  
Option 3 ID : 40255717135  
Option 4 ID : 40255717136  
Status : Answered  
Chosen Option : D

Q.66 Trammel is most commonly used tool in

- A. Sheet metal work
- B. Forging
- C. Welding
- D. Casting

Ans  A. A

B. B

C. C

D. D

Question ID : 4025574304

Option 1 ID : 40255717213

Option 2 ID : 40255717214

Option 3 ID : 40255717215

Option 4 ID : 40255717216

Status : Answered

Chosen Option : A

Q.67 Kinematic similarity between model and prototype means

- A. The similarity of forces
- B. The similarity of shape
- C. The similarity of motion
- D. The similarity of discharge

Ans  A. A

B. B

C. C

D. D

Question ID : 4025574298

Option 1 ID : 40255717189

Option 2 ID : 40255717190

Option 3 ID : 40255717191

Option 4 ID : 40255717192

Status : Answered

Chosen Option : C

**Q.68** A tension member of diameter 'd' is designed with factor of safety of 3. If the load and the diameter are doubled, then factor of safety will be ---- for the same yield stress of 240MPa.

- A. Unchanged
- B. Reduced to half
- C. Doubled
- D. Tripled

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574269  
Option 1 ID : 40255717073  
Option 2 ID : 40255717074  
Option 3 ID : 40255717075  
Option 4 ID : 40255717076  
Status : Answered  
Chosen Option : C

**Q.69** Two helical tensile springs of the same material and also having identical mean coil diameter and weight, have wire diameters d and d/2. Find the ratio of their stiffnesses.

- A. 1
- B. 4
- C. 16
- D. 64

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574274  
Option 1 ID : 40255717093  
Option 2 ID : 40255717094  
Option 3 ID : 40255717095  
Option 4 ID : 40255717096  
Status : Answered  
Chosen Option : C

Q.70 At breakeven point

- A. Total cost is more than sales revenue
- B. Total cost is less than sales revenue
- C. Total cost is equal to sales revenue
- D. Fixed cost is equal to variable cost

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574307  
Option 1 ID : 40255717225  
Option 2 ID : 40255717226  
Option 3 ID : 40255717227  
Option 4 ID : 40255717228  
Status : Answered  
Chosen Option : C

Q.71 The form factor of a spur gear tooth depends on

- A. Circular pitch
- B. Pressure angle
- C. No. of teeth
- D. both A&B

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574272  
Option 1 ID : 40255717085  
Option 2 ID : 40255717086  
Option 3 ID : 40255717087  
Option 4 ID : 40255717088  
Status : Answered  
Chosen Option : D

Q.72 Which of the following metals has high specific strength?

- A. Mild steel
- B. Stainless steel
- C. Titanium alloys
- D. Aluminum alloys

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574251  
Option 1 ID : 40255717001  
Option 2 ID : 40255717002  
Option 3 ID : 40255717003  
Option 4 ID : 40255717004  
Status : Answered  
Chosen Option : C

Q.73 Which of the following is structural formula of n-Propyl alcohol?

- A.  $\text{H}_3\text{C}-\text{CH}_2-\text{OH}$
- B.  $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{OH}$
- C.  $\text{H}_3\text{C}-\text{O}-\text{CH}_3$
- D.  $\text{H}_3\text{C}-\text{O}-\text{CH}_2-\text{CH}_2-\text{CH}_3$

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574318  
Option 1 ID : 40255717269  
Option 2 ID : 40255717270  
Option 3 ID : 40255717271  
Option 4 ID : 40255717272  
Status : Answered  
Chosen Option : B

Q.74 The ability of tool steel to retain its hardness at high temperature commonly developed during cutting of materials is called

- A. Red hardness
- B. Hardenability
- C. Strain hardening
- D. Case hardening

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574249  
Option 1 ID : 40255716993  
Option 2 ID : 40255716994  
Option 3 ID : 40255716995  
Option 4 ID : 40255716996  
Status : Answered  
Chosen Option : A

Q.75 A 16mm diameter bar elongates by 0.04% under a tensile force of 16kN. The average decrease in diameter is found to be 0.01%. With these conditions, what is the Poisson's ratio.

- A. 0.25
- B. 0.90
- C. 0.50
- D. 0.75

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574267  
Option 1 ID : 40255717065  
Option 2 ID : 40255717066  
Option 3 ID : 40255717067  
Option 4 ID : 40255717068  
Status : Not Answered  
Chosen Option : --

Q.76 During one thermodynamic cycle, the working fluid in an engine engages in two work interactions which are 15KJ to the fluid and 44KJ from the fluid and three heat interactions, two which are 75KJ to the fluid and 40KJ from the fluid. Evaluate the magnitude of the Third Heat transfer

- A. 6KJ
- B. 8KJ
- C. 12KJ
- D. 24KJ

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574308  
Option 1 ID : 40255717229  
Option 2 ID : 40255717230  
Option 3 ID : 40255717231  
Option 4 ID : 40255717232  
Status : Not Answered  
Chosen Option : --

Q.77 In a thick cylindrical shell, the maximum radial stress  $f$  at the outer surfaces of the shell is

- A. Zero
- B.  $f$
- C.  $-f$
- D.  $2f$

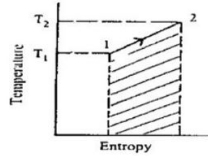
Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574266  
Option 1 ID : 40255717061  
Option 2 ID : 40255717062  
Option 3 ID : 40255717063  
Option 4 ID : 40255717064  
Status : Answered  
Chosen Option : A



Q.78 In the T-S diagram shown in the figure, which one of the following is represented by the area under the curve?

- A. Total work done during the process
- B. Total heat absorbed during the process
- C. Total heat rejected during the process
- D. Degree of irreversibility



Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574300  
Option 1 ID : 40255717197  
Option 2 ID : 40255717198  
Option 3 ID : 40255717199  
Option 4 ID : 40255717200  
Status : Answered  
Chosen Option : B

Q.79 Calculate the molarity of a solution containing 10 g of NaOH in 500 mL solution

- A. 0.25M
- B. 0.5 M
- C. 0.75 M
- D. 1.0 M

Ans  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574320  
Option 1 ID : 40255717277  
Option 2 ID : 40255717278  
Option 3 ID : 40255717279  
Option 4 ID : 40255717280  
Status : Not Answered  
Chosen Option : --

- Q.80** Optical pyrometers are used for
- A. Measuring spindle speed of lathe
  - B. Measuring purity of molten metal
  - C. Measuring surface finish
  - D. Measuring Forging temperature

**Ans**  A. A  
 B. B  
 C. C  
 D. D

Question ID : 4025574244  
Option 1 ID : 40255716973  
Option 2 ID : 40255716974  
Option 3 ID : 40255716975  
Option 4 ID : 40255716976  
Status : Answered  
Chosen Option : D



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