

3 a. Choose the correct answers for the following :

- i) In petrol engine heat is supplied at constant _____
 A) Temperature B) Volume
 C) Pressure D) Enthalpy
- ii) Carburettor is used in _____ engine
 A) Diesel B) Petrol
 C) Crude oil D) None of these
- iii) The link that connects the Piston and Crank shaft by means of pin joints is called as ____
 A) Cylinder B) Cam Shaft
 C) Connecting Rod D) None
- iv) Number of strokes required to complete 1 cycle in 4 stroke engine is _____
 A) 8 B) 2
 C) 1 D) 4. (04 Marks)

b. With the help of a p-v diagram, explain the working of 4 stroke diesel engine. (10 Marks)

c. The following data were recorded on a 4-stroke engine. Bore = 25 cm, stroke = 40 cm, crank speed = 250 rpm. Net load on brake drum = 700 N. Diameter of brake drum = 2 m, indicated $mep = 6$ bar. Fuel consumption = 0.0013 kg/sec. Sp gr of fuel = 0.78, CV. of fuel = 43900 kJ/kg. Find i) BP ii) IP iii) FP. (06 Marks)

4 a. Choose the correct answers for the following :

- i) The boiling point temperature of Freon – 12 is _____
 A) -20.8°C B) -29.8°C
 C) -40.8°C D) -33.3°C
- ii) A good refrigerant should have _____
 A) Low Specific Heat B) Low Viscosity
 C) Low Freezing Point D) All
- iii) Commonly used refrigerant in vapour absorption refrigeration system is _____
 A) Freon – 22 B) Freon - 12
 C) Ammonia D) CO_2
- iv) The performance of a refrigerator is measured by a factor known as _____
 A) Ton of refrigeration B) COP
 C) Litres D) None. (04 Marks)

b. What are the desirable properties of refrigerant? List four commonly used refrigerants. (06 Marks)

c. Explain with a neat sketch the working of vapour compression refrigeration. (10 Marks)

7 a. Choose the correct answers for the following :

- i) In pressure welding the parts to be joined are heated to _____ state
 A) Liquid State B) Boiling State
 C) Plastic State D) none of these
- ii) The joining process which uses special fusible alloy to join 2 similar or dissimilar parts is _____
 A) Soldering B) Brazing
 C) Welding D) All
- iii) An example for solid lubricants is _____
 A) Synthetic Oil B) Grease
 C) Tale D) None
- iv) _____ is a property of a good lubricant
 A) Porosity B) Electricity
 C) Viscosity D) None.

(04 Marks)

b. Sketch and explain electric arc welding process.

(08 Marks)

c. What is the necessity of lubrication? List the types of lubricants used.

(04 Marks)

d. With a neat sketch explain the ball bearing.

(04 Marks)

8 a. Choose the correct answers for the following :

- i) The gear used for intersecting axes shafts is _____ gear
 A) Spur B) Helical
 C) Spiral D) Bevel
- ii) The ratio of pitch diameter to the number of teeth is called _____
 A) Module B) Dedendum
 C) Addendum D) None
- iii) Due to slip of the belt, the velocity ratio of the belt drive _____
 A) Decreases B) Increases
 C) Remains Same D) None of these
- iv) The length of open belt pulley of diameters d_1 and d_2 kept at a distance 'x' apart is _____

$$A) \frac{\pi}{2}(d_1 + d_2) + 2x + \frac{(d_1 + d_2)^2}{4r}$$

$$B) \frac{\pi}{2}(d_1 - d_2) + 2x + \frac{(d_1 - d_2)^2}{4r}$$

$$C) \frac{\pi}{2}(d_1 + d_2) + 2x + \frac{(d_1 - d_2)^2}{4r}$$

$$D) \frac{\pi}{2}(d_1 - d_2) + 2x + \frac{(d_1 + d_2)^2}{4r}$$

(04 Marks)

b. A compound gear train consists of 4 gears P, Q, R and S having 20, 40, 60 and 80 teeth respectively. The gear P is keyed to driving shaft, Gear S to driven shaft. Q and R are compound gears, Q meeting with P and R meshes S. If P rotates at 150 rpm, what is the rpm of gear S.

(08 Marks)

c. Distinguish between : i) Open and cross belt drive

ii) Simple and compound gear train.

(08 Marks)

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