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Paper Code: V127-103 (RE-F&FS)

JUNE 2018 / RE - EXAM

F. Y. B. TECH. (COMMON) (SEMESTER - II)**COURSE NAME: Basic Mechanical Engineering****COURSE CODE: ME12173****(2017 PATTERN)**

Time: [2 Hours]

[Max. Marks: 50]

(*) Instructions to candidates:

- 1) Answer Q.1 OR Q.2, Q.3 OR Q.4 and Q.5
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

Q.1) a) Explain any six sheet metal operations [6]
b) Explain Lathe machine with block diagram. State various operations performed on it [6]

c) Write short note on sand casting process [4]

OR

Q.2) a) Give classification of metal joining process. Explain Metal arc welding in detail [6]
b) Explain different Drilling machine operations [6]
c) Explain any four milling operations [4]

Q.3) a) Explain with neat sketch the working of Four stroke S. I. Engine? [6]
b) Give the comparison between fire tube and water tube boilers [4]
c) Define one ton of refrigeration and C.O.P [4]

OR

Q.4) a) Explain with neat sketch any one fire tube boiler. [6]
b) Explain with neat sketch working of window air conditioner [4]
c) Compare S. I. and C.I. Engines [4]

Q.5) Attempt following multiple choice questions:

01. In a non flow reversible 300 kJ of heat leaves the system consisting of a gas. The internal Energy of the gas remains the same. Calculate the work done. [02]
a) 200kJ b) 240 KJ c) -300 kJ d) 260 kJ

page (C)

02. What will be the maximum efficiency of a heat engine operating between 227°C and 27°C [02]

- a) 30% b) 40% c) 20% d) 60%

03. Gear 1 rotates 1200rpm in counter clockwise direction and engages with gear 3. Gear 3 and Gear 4 are mounted on same shaft. Gear 5 engages with Gear 4. The number of teeth on Gear 2, 3, 4 and 5 are 20, 40, 15 and 30 respectively. The angular speed of gear 5 is [02]

- a) 300 rpm b) 350 rpm c) 250 rpm d) 400 rpm

04. In the gearing machine tool, the motor shaft is connected to gear 4 and rotates at 975 rpm. The gear wheels B, C, D and E are fixed on parallel shaft rotating together. Gear C and D are mounted on same shaft. What is speed of gear F? The number of teeth on each gear is given below [02]

Gear	A	B	C	D	E	F
No of Teeth	20	50	25	75	26	65

- a) 50 b) 52 c) 54 d) 56

05. According to first law of thermodynamics [02]

- a) Total internal energy of a system during a process remains constant
b) Total energy of a system remains constant
c) Work done by a system is equal to the heat transferred by the system
d) None of the above

06. Grinding wheel is made up of [02]

- a) Steel b) cast iron c) ceramic d) composite

07. Carbon content of mild steel can be [02]

- a) 0.51% b) 0.85% c) 0.15% d) 1.25%

08. The total capacity of the material to absorb energy without fracture is called [02]

- a) Resilience b) malleability c) ductility d) toughness

09. Spur gears are used to transmit motion between ----- shafts. [01]

- a) Two perpendicular b) to inclined c) two parallel d) all of above

10. The following is not a ferrous material [01]

- a) stainless steel b) alloy steel c) brass d) cast iron

11. Which among the following is correct relation between COP of heat pump and COP of refrigerator? [01]

- a) $[\text{COP}]_{\text{H.P.}} = 1 + [\text{COP}]_{\text{ref}}$ b) $[\text{COP}]_{\text{H.P.}} = 1 - [\text{COP}]_{\text{ref}}$

- c) $[\text{COP}]_{\text{H.P.}} = [\text{COP}]_{\text{ref}}$ d) none of the above

12. The property which is important in wire drawing is [01]

- a) malleability b) plasticity c) ductility d) resilience