Total No. of Questions – [05] Total No. of Printed Pages 02

G.R. No.	

Paper Code - U127-103 (ESE)

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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 lathe operations [6]
b) What is grinding? Explain surface grinding process. [6]
c) Write short note on sand casting process [4]

OR

Q.2) a) Explain following drilling operations [6]
1 counter boring
2 counter sinking
3 reaming
b) Give classification of metal joining process. Explain Gas welding in detail [6]
c) Draw labelled diagram of sensitive drilling machine [4]

Q.3) a) Give the detail classification of internal combustion engine. [6]
b) Explain with neat sketch working of Domestic refrigerator. [4]
c) Draw sketch of centrifugal compressor. [4]

OR

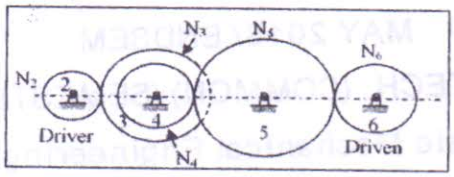
Q4) a) Explain with neat sketch working of window air conditioner. [6]
b) Explain with neat sketch working of centrifugal pump [4]
c) Compare S. I. and C.I. Engines. [4]

Q.5) Attempt following multiple choice questions:

01. During a Cycle consisting of 4 processes, the heat transfers are 60kJ, -8 kJ, -34 kJ and 6 kJ. Determine the net work for the cycle [02]
a) 12 kJ b) 30 kJ c) 40 kJ d) 24 kJ

02. What will be the maximum efficiency of a heat engine operating between 227^0 C and 27^0 C_____ [02]
a) 30% b) 40% c) 20% d) 60%

03. A gear train is made up of five spur gears. Gear 2 is driver and gear 6 is driven member N2, N3, N4, N5 and N6 represent number of teeth on gears 2,3,4,5 and 6 respectively. Gear 3 and 4 are mounted on same shaft. The gear (s) which act(s) as idler(s) is/are [02]



a) Only 2 b) Only 4 c) Only 5 d) Both 3 and 4

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. The measurement of a thermodynamics property known as temperature is based on_____ [02]

a) Zeroth law of thermodynamics b) First law of thermodynamics
c) Second law of thermodynamics d) Third law of thermodynamics

06. Grinding wheel is made up of_____ [02]

a) Steel b) cast iron c) ceramic d) abrasive

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

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

08. The property of material to be drawn into the sheets is known as ---------- [02]

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

09. Bevel 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 ferrous material [01]

a) Zinc b) Tin c) brass d) cast iron

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

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

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

12. The power transmitted by means of belt drives depends upon. [01]

a) Velocity of the belt b) Tension under which the belt is placed on the pulleys

c) Arc of contact between the belt and smaller pulley d) all of the above