G.R. No. [   ]   UI18-1011 (BE-FS)

DEC.- 2018 / BACKLOG 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 wherever required

Q.1) a) Explain any three press working operations with neat sketches.   [6]
   b) What is casting? Explain sand casting process with neat sketch.   [6]
   c) Write short note on surface grinding.   [4]

OR

Q.2) a) Explain following Lathe operations with neat sketch.   [6]
   1. Facing
   2. Turning
   3. Knurling
   b) Explain with neat sketch electric arc welding.   [6]
   c) Draw labeled diagram of Radial drilling machine.   [4]

Q.3) a) Give the detail classification of boilers.   [6]
   b) Define One ton of refrigeration and C.O.P   [4]
   c) Draw neat sketch of centrifugal Pump.   [4]

OR

Q4) a) Explain with neat sketch working of domestic refrigerator.   [6]
   b) Explain with neat sketch working of centrifugal compressor.   [4]
   c) Compare petrol and diesel engines.   [4]

Q.5) Attempt following multiple choice questions:
   01.   During a Cycle consisting of 4 processes, the heat transfers are 50kJ, -10 kJ, -30 kJ   [2]
         and 20 kJ. Determine the network for the cycle
         a) 12 kJ   b) 30 kJ   c) 50 kJ   d) 24 kJ
   02.   What will be the maximum efficiency of a heat engine operating between 600 K and   [2]
         300 K_____

         a) 30%   b) 40%   c) 20%   d) 50%

03. A Carnot cycle heat engine has an efficiency of 40 %. If the heat engine receives **[2]**
425 kJ of heat from the source, the net work done is --------------
a) 180 kJ   b) 190 kJ   c) 170 kJ   d) 160 kJ

04. Two parallel shafts, about 600 mm apart are to be connected by spur gears. One **[2]**
shaft is to run at 360 r.p.m. and the other at 120 r.p.m. The speed ratio is -------
a) 4   b) 3   c) 5   d) 6

05. The First law of thermodynamics gives the concept of_____ **[2]**

a) Pressure   b) Temperature

c) Internal Energy   d) None of these

06. The following material is used for manufacturing of tubes, wires and cables_____ **[2]**

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

07. The material used for aircraft and missile applications is_____ **[2]**
a) Steel   b) cast iron   c) Aluminum   d) copper

08. The Percentage of carbon in high carbon steel is ----------- **[2]**

a) 0.3 - 0.6   b) 0.6 -1.5   c) 0.05 - 0.3   d) 0.1 - 0.3

09. Spur gears are used to transmit motion between ------------ shafts. **[1]**
a) two perpendicular   b) to inclined   c) two parallel   d) all of above

10. The following is non metallic material **[1]**
a) Ceramic   b) Tin   c) brass   d) cast iron

11. Which among the following is correct relation between COP of heat pump and COP **[1]**
of refrigerator?
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 following belt have no slip--------------- **[1]**
a) Flat   b) Vee   c) Rope   d) Timing