Code No. 11404/CBCS

FACULTY OF ENGINEERING

B.E III-Semester (CBCS) (ECE) (Main & Backlog) Examination,
November / December 2018

Subject : Elements of Mechanical Engineering

Time: 3 Hour **Max. Marks : 70**

Note: Answer All questions From Part-A and any FIVE questions From Part-B.

PART-A (10x2 = 20 Marks)

1. Define path function
2. Define Zeroth law of thermodynamics. What is its importance
3. What are the causes of irreversibility?
4. What is the effect of clearance volume on work input and compression?
5. State Fourier's law of heat conduction and write the S.I. units of all terms
6. What is Newton's law of cooling?
7. Write about the concept of Black body
8. Compare belt drive and gear drive with respect to power transmission
9. Define addendum and dedendum
10. What are the different types of patterns used in casting?

PART-B (5 x 10 = 50 Marks)

11. A) Define enthalpy. Compare it with internal energy 4
    b) A heat engine operates on Carnot cycle between source and sink temperatures 227°C and 27°C respectively. If the heat engine receives 400KJ from the source. Find the network done, heat rejected to the sink and efficiency of the engine 6

12 a) Distinguish between four stroke and two stroke engine with power and fuel consumption 4
    b) During the testing of an engine the following readings were observed: Speed-1600rpm, net load on the brake drum = 1200N, brake drum radius = 0.65m. Find the torque and brake power developed by the engine 6

13 a) Derive an expression for heat loss through a composite wall of layers considering conductive heat transfer coefficient 4

    b) A brick wall (K-0.72 W/mK) is 0.6, thick. If the temperature of the inner and outer surfaces are maintained at 100°C and 25°C respectively Calculate the heat loss through the wall per square meter. Also find the temperature at the interior point of the wall at 16cm distance from outside surface. 6

14 a) Write about the classification of gears and their applications 5
    b) Sketch epi-cyclic gear train and explain it's working with diagram 5

15 a) What are different milling operations? Explain any two of them with diagram 5
    b) Sketch and explain the working of USM 5

16 a) What is critical radius of insulation? Explain with of derivation 5
    b) Explain about forging operation in metal forming 5

17 Write short notes on the following:
    a) Clausis inequality 3
    b) Working of single stage compressor 4
    c) Welding process 3

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