Register Number | | | | | | |

III Semester Diploma Examination, April/May-2018

ELEMENTS OF MECHANICAL ENGINEERING

Time : 3 Hours] [Max. Marks : 100

Note :   Answer any **six** questions from Part-A and **seven** full questions from Part-B.

PART – A

Answer any **six** questions.   6 × 5 = 30

1. Define Kinematic pair with examples.   5

2. Explain with sketch scotch yoke mechanism.   5

3. List the merits and demerits of Chain drive.   5

4. Explain open belt drive with its applications.   5

5. Explain cone pulley with a sketch.   5

6. Explain bending equation.   5

7. Define Zeroth and first law of thermodynamic.   5

8. Explain thermal equilibrium.   5

9. List out different refrigerants used in air conditioning system.   5

PART – B

Answer any **seven** full questions.   7 × 10 = 70

10. (a) Explain quadric cycle chain with sketch.   5
    (b) Differentiate between machine and mechanism.   5

11. (a) In a open belt drive system, the diameter of the driving pulley is 200 mm and of the driven pulley is 100 mm. If the driven pulley is rotating at a speed of 600 rpm, determine the speed of the driving pulley.   5
    (b) Explain Slip and Creep in belt drive.   5
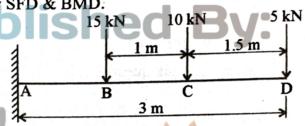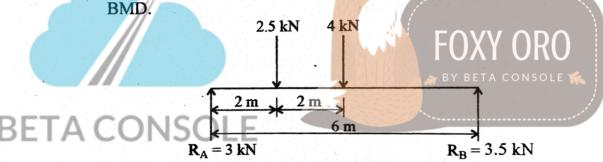
12.   (a)   Explain Young's modulus, bulk modulus and rigidity modulus.   5

     (b)   Determine the diameter of a metal wire subjected to a load of 1 kN, developing a stress of 20 N/mm². If E = 2 × 10⁵ N/mm² for the wire, what will be the change in length over a length of 5000 mm.   5

13.   (a)   Explain stress – strain diagram with sketch.   5

     (b)   Explain different types of stress.   5

14.   (a)   Explain SFD and BMD.   5

     (b)   A cantilever beam of length 3 m is subjected to a point loads as shown in figure. Draw SFD & BMD.   5

15.   (a)   A simply supported beam of length 6 m carries a point load of 2.5 kN and 4 kN at a distance of 2 m and 4 m from left support as shown in figure. Draw SFD & BMD.   6

     (b)   Explain Neutral axis.   4

16.   (a)   Explain adiabatic process with P-V & T-S diagrams.   5

     (b)   State Boyle's law & Charle's law.   5

17.   (a)   Explain diesel cycle with P-V diagram & write equation for efficiency.   5

     (b)   Find the efficiency of an otto cycle Engine with compression ratio of 6.25 and adiabatic index 1.4.   5

18.   (a)   With a neat sketch, explain Four Stroke Petrol Engine.   5

     (b)   Differentiate between Petrol and Diesel Engine.   5

19.   (a)   List out properties of a good refrigerant.   5

     (b)   With neat sketch, explain Summer air conditioning.   5