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Code No. : 15559 O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) V-Semester Backlog Examinations, Jan./Feb.-2024

Dynamics of Machines

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	What is meant by turning moment diagram or crank effort diagram?	2	1	1	1
2.	What is the effect of gyroscopic couple on rolling of ship? Why?	2	1	1	1
3.	State the conditions for static and dynamic balancing.	2	1	2	2
4.	Why complete balancing is not possible in reciprocating engine?	2	2	2	3
5.	List the principles used for calculating the friction torque in collar bearings.	2	1	3	2
6.	What is meant by self locking and self energizing brake?	2	2	3	3
7.	What is meant by isochronous conditions governor?	2	1	4	1
8.	Define the maximum fluctuation of energy in fly wheel.	2	1	4	2
9.	What are the causes and effect of vibration?	2	2	5	2
10.	Define damping ratio or damping factor.	2	2	5	3
<b>Part-B (5 × 8 = 40 Marks)</b>					
11.	A vertical petrol engine with cylinder of 150mm diameter and 200mm strokes has a connecting rod of 350mm long. The mass is 1.6kg and the engine speed is 1800 rpm. On the expansion stroke with crank angle 30° from TDC, the gas pressure is 750KPa. Determine the net thrust on the piston.	8	3	1	4
12.	Four masses $M_1$ , $M_2$ , $M_3$ , and $M_4$ are 200kg, 300kg, 240kg and 260kg respectively. The corresponding radii of rotation are 0.2m, 0.15m, 0.25m and 0.3m respectively and the angle between successive masses 45°, 75°, and 135°. Find the position and magnitude of balance mass required if its radius of rotation is 0.25m.	8	3	2	4
13. a)	Explain the working of single plate clutch with a neat sketch.	4	2	3	2
b)	Classify Dynamometers and explain any one of them.	4	1	3	1

Contd... 2

14.	A porter governor has equal arms each 250mm long and pivoted on the axis of rotation. Each ball has a mass of 5kg and mass of the central load on the sleeve is 25kg. The radius of rotation of the ball is 150mm when governor is at maximum speed. Find the maximum and minimum speed and range of speed of the governor.	8	3	4	4
15. a)	Explain the Critical speed.	3	3	5	1
b)	An instrument vibrates with a frequency of 1Hz when there is no damping. When the damping is provided, the frequency of damped vibration was observed to be 0.9Hz. Find, (i) damping factor (ii) logarithmic decrement.	5	4	5	4
16. a)	Explain the effect of Gyroscopic couple on a Aeroplane.	4	2	1	2
b)	Explain the effects of partial balancing in two cylinder locomotive engine.	4	4	2	1
17.	Answer any <i>two</i> of the following:				
a)	Discuss the working of band brake.	4	2	3	2
b)	Discuss the turning moment diagram of a single cylinder-four stroke IC engine.	4	2	4	2
c)	Discuss the types of vibrations.	4	2	5	1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	35%
iii)	Blooms Taxonomy Level – 3 & 4	45%

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