

Hall Ticket Number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Code No. : 13761 N/O (B)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

(Accredited by NAAC with A++ Grade)

B.E. III-Semester Bridge Course Main & Backlog Examinations, February-2024

Mechanics for Engineers

(Common for Civil & Mech.)

Time: 3 hours

Max. Marks: 50

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 rigid body?	2	1	1	1
2.	Define concurrent coplanar force system.	2	1	1	1
3.	Define varignon's theorem.	2	1	2	1
4.	What is law of transmissibility?	2	1	2	1
5.	Differentiate static and kinetic friction?	2	2	3	2
6.	Define angle of friction.	2	2	3	2
7.	Differentiate rectilinear and curvilinear motion.	2	2	4	1
8.	If particle has displacement (S) equation, $S = t^3 + 6t + 25$, find its velocity at $t = 3$ sec	2	2	4	2
9.	Write the D'Alembert principle?	2	3	5	2
10.	How kinetics differs from the kinematics?	2	2	5	2
Part-B (5 × 6 = 30 Marks)					
11. a)	Differentiate between the Moment and Couple?	3	1	1	1
b)	Find the resultant for the force system shown in fig 1.	3	2	1	2

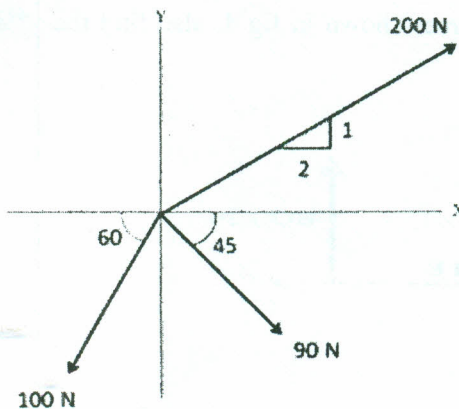


Fig 1

12. a)	A tripod is connected by three cables AB, CB and DB, the spatial co-4 ordinates of the points are A(2,3,4), B(4,6,8),C(1,5,8) and D(-3,6,-8), write the force vector in each cable, if the force multiplier is 20kN/m.	4	3	2	2
b)	Differentiate between the 2d force system and 3D force system.	2	2	2	2
13. a)	Define wedge friction? What are the applications of this friction?	2	2	3	2
b)	Find the horizontal force required for the system shown in fig-3, if W_A is 200kN and W_B is 250kN, friction at all the contact surfaces are 0.3	4	3	3	2
Fig 3					
14. a)	Differentiate the rectilinear motion and curvilinear motion and write the governing equations in both cases.	3	3	4	3
b)	A flight is moving horizontally from an altitude of 3KM from the ground at a speed of 500KMPH, a particle is dropped from the flight , find the horizontally distance travelled by the particle also find the velocity of the particle while hitting the ground with the direction.	3	3	4	3
15. a)	Distinguish between the plane motion and circular motion, what is the importance of instantaneous center in the kinetics of the rigid body.	3	2	5	2
b)	Write the applications of the D'Alembert principle.	3	3	5	2
16. a)	Find the resultant force for the system of forces shown in fig 4, also find the resultant moment about horizon.	3	4	1	2
Fig 4					

- b) The three non-coplanar forces displayed in Fig. 5. Pass through the origin. Determine the resultant by finding its magnitude and the angles it makes with the coordinate axes. The distances shown are in cm

3 3 2 3

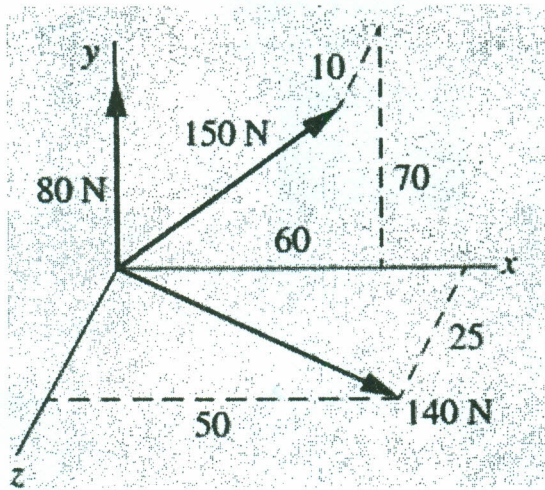


Fig 5

17. Answer any *two* of the following:

- a) Differentiate between the rigid body and flexible body.
 b) Write the laws of friction.
 c) A stone is dropped into a well of depth H, and hears a sound wave after sec find the depth of well also velocity of stone while hitting the water. Take velocity of sound is 330mps.

3 1 3 2
 3 3 4 3
 3 4 5 3

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%
