

ID.No./Seat No.



MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY,
JAMSHORO.

**SECOND TERM FIRST YEAR (2ND TERM) B.E.(ELECTRICAL) REGULAR
EXAMINATION 2009 OF 09-BATCH**

APPLIED MECHANICS

Dated: 23-11-2009 Time Allowed: 03 Hours. Max.Marks 80

NOTE: ATTEMPT ANY FIVE QUESTIONS.

DRAW NEAT AND CLEAN SKETCHES WHERE REQUIRED

<u>Q.No.</u>	<u>Marks</u>
01: (a) Define force & discuss its various characteristics.	(4)
(b) Four forces of magnitudes 10N, 20N, 30N & 40N act in the direction s of north, south, east & west respectively.	(6)
(c) Find the magnitude & direction of their resultant. Find he components of the forces shown in fig (1) parallel & perpendicular to the inclined plane.	(6)
02: (a) Describe the analytical procedure for finding out the resultant of two non rectangular components.	(6)
(b) Find the greatest & least resultant of the two forces with magnitudes of 100N & 150N.	(4)
(c) Resolve the forces shown in fig (2) into components along U & V axes.	(6)
03: (a) Distinguish between moment and couple.	(6)
(b) In Fig.Q.No.3(b), Find the y-coordinate of point A so that the 361-lb force will have a clock wise moment of 400 ft-lb about O. Also determine the X and Y intercepts of the action line of the force.	(10)
04: (a) Define equilibrium & friction.	(4)
(b) A bar AE is in equilibrium under the action of five forces as shown in fig (5). Determine the values of forces P, R, & T.	(6)
(c) A ball is thrown vertically into the air at 40 m/sec. After 3sec another ball is thrown vertically . What initial velocity must the second ball have to pass the first ball at 50m from the ground.	(6)
05: (a) Define Equation of continuity. Derive Bernoulli's equation for steady flow of an incompressible fluid.	(10)
(b) A horizontal venturimeter 150 mm * 75mm is used to measure the flow of an oil of specific gravity 0.85. Determine the deflection of mercury gauge if the discharge of oil is 45 l/sec.	(6)
06: (a) Define Density, Specific gravity, Viscosity,Capillarity and Bulk modulus.	(5)
(b) Differentiate between simple manometer and Differential manometer.	(5)
(c) A 50mm dia orifice is discharging water under a head of 8m. Calculate the actual velocity and actual discharge of the jet of water at vena contracta , if $c_d = 0.6$ and $c_v = 0.9$.	(6)
07: (a) Define stress and its various types. What is principle of super position? Obtain a relation for the elongation of bar when it hangs vertically under its own weight.	(10)
(b) A hollow cast iron column has an internal dia of 200mm. What should be the external dia of the column so that it can carry a load of 16MN without stress exceeding 90 MPa.	(6)
08: (a) Define Moment of Inertia.	(6)
(b) Determine the moments of inertia with respect to the centroidal x-axes of the wide flange beam section as shown in Fig.No.8(b).	(10)