SCHEME OF VALUATION
(Scoring indicators)

Revision:-2015 Course Code: TED(15) 2003
Course Title :-Engineering Physics II

Qst. No.	Scoring Indicator	Split up score	Sub Total	Total
I	PART- A			
1.	Accelaration towards centre	1	2	
	V^2/r or any one expression.	1		
2.	Statement.	2	2	
3.	Voltage law.	2	2	
4.	Definition.	2	2	
5.	Explanation.	2	2	10
II	PART-B			30
1.	Proper explanation of getting centripetal force.	3	6	
	Banking of curve.	3		
2	Parallel axis theorem	3	6	
	Perpendicular axis theorem	3		
3	Explanation	3	6	
	Application			
4	statement with equation	4	6	
	$B = \mu_0 NI / 2R$	2		
5	2 Mark for each law	6	6	
6	3 characteristics	3	6	
	3 applications	3		
7	Change in mass =0.026 amu	4	6	
	Energy = 0.026 X 931 =24.2 Mev	2		

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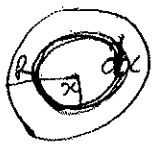
				15
III a.	**.PART-C** $I = MK^2$ Sum of product of mass and squre of the distance of different particles from axis of rotation.	1 2	3	
b.	mass of disc $= M$ area " $= \pi R^2$ Mass/area $= \frac{M}{\pi R^2}$  area of rmj $= 2\pi x dx$ Mass of rmj $= 2\pi x dx \frac{M}{\pi R^2} = \frac{2M}{R^2} x dx$ $I_{rmj} = \Sigma m r^2 = \frac{2M}{R^2} x dx \cdot x^2$ $I_{disc} = \int_{x=0}^{x=R} I_{rmj}$ steps & result $\frac{MR^2}{2}$	2 2 2	6	
c.	$K.E_{rot} = \frac{1}{2} mv^2 + \frac{1}{2} I\omega^2$ or $3/4\, mv^2$ substitution $= 0.0675\ J$ **OR**	2 2 2	6	
IV a.	Definition $\tau = \frac{dL}{dt}$	1½ 1½	3	15

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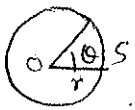
IV	PART C			
b.	Definition	2	6	
				
	$\omega = \frac{\theta}{t}$ $\theta = \frac{s}{r}$ $v = \frac{s}{t}$	4		
	$\omega = \frac{s}{rt} = \frac{v}{r}$			
	$v = r\omega$			
c.	$\alpha = \frac{\omega_2 - \omega_1}{t}$	1½	3	
	Substitution & result $2.616\ rad/s^2$	1½		
		1½		
d.	$F = m\omega^2 r$	1½	3	
	Substitution & result $\omega = 100\ rad/s$			
V a.	revolving around poles	1	3	15
	2 applications	2		
b.	orbital velocity derivation			
	$\frac{mv^2}{(R+h)} = \frac{GMm}{(R+h)^2}$ - steps &	1	3	
	$v = \sqrt{\frac{GM}{R+h}}$	2		

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Qst. No.	Scoring Indicator	Split up score	Sub Total	Total
	orbital period = $\frac{\text{distance in 1 rev.}}{\text{orb. velocity}}$	1	3	
	steps			
	$T = \frac{2\pi(R+h)}{\sqrt{\frac{GM}{R+h}}}$	2		
	$= 2\pi\sqrt{\frac{(R+h)^3}{GM}}$ or $2\pi\sqrt{\frac{(R+h)^3}{R^2g}}$			
c.	$T = 2\pi\sqrt{\frac{(R+h)^3}{R^2g}}$	2		
	Simplification			
	$T^2 = \frac{4\pi^2(R+h)^3}{R^2g}$			6
	$\frac{T^2R^2g}{4\pi^2} = (R+h)^3$	4		
	$(R+h) = \sqrt[3]{\frac{T^2R^2g}{4\pi^2}}$			
	$h = \sqrt[3]{\frac{(24\times60\times60)^2(6400\times10^3)^2\times9.8}{(3.14)^2}} - 6400\times10^3$			
	$= 35912\times10^3$ m			

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OR

VI a

$M.R^2 mg$

gravitational pull $F = mg$

gra. Force due to Newtons Law of gravi. $F = \frac{GMm}{R^2}$ — 1½ — 3

$mg = \frac{GMm}{R^2}$ — 1½

$g = \frac{GM}{R^2}$

b. Definition. — 2

explanation escape velocity — 2 — 6

expression $v = \sqrt{2Rg}$ or $\sqrt{\frac{2GM}{R}}$ — 2

c. $v = \sqrt{\frac{GM}{(R+h)}}$ — 2

Substitution — 2 — 6

$v = 7722.81 \text{ m/s}$ — 2

VII a. Statement — 3 — 3 — 15

b. Principle $F = BIl\sin\theta$ — 2 — 6

Construction and working — 4

c. $S = \frac{Ig}{I - Ig}$ — 1½

Substitution & result $S = 0.505\,\Omega$ in parallel — 1½ — 3

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$R = \frac{E}{I_g} - G$ $1\frac{1}{2}$

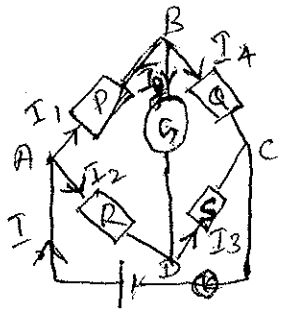
substitution & result $R = 450\,\Omega$ in series $1\frac{1}{2}$ 3

OR

VIII @ definition or $\rho = \frac{RA}{L}$ $1\frac{1}{2}$ 15

definition or $\sigma = \frac{1}{\rho} = \frac{L}{RA}$ $1\frac{1}{2}$ 3

(b) Diagram



2

Applying kirchoffs laws deduce eqn,

$I_1 = I_4$ —①

$I_2 = I_3$ —②

$I_1 P = I_2 R$ —③ 3 6

$I_4 Q = I_3 S$ —④

③/④ $\frac{P}{Q} = \frac{R}{S}$ $\therefore S = \frac{RQ}{P}$ 1

c. $\rho = \frac{RA}{L} = \frac{R\pi r^2}{L}$ 2

Substitution & Result

$\rho = 1.7 \times 10^{-8}\,\Omega m$ 4

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IX				
a.	Three advantages	3	3	15
b.	Diagram	2		
			6	
		4		
	working			
c.	$h\frac{c}{\lambda} = \phi + \frac{1}{2}mv^2$	2		
			6	
	Substitution and finding $\phi = 9.89 \times 10^{-19}$ J	4		
	OR			
X		3	3	15
a	Three uses			
b.	Diagram	2		
			6	
	working	4		
c.	$h\frac{c}{\lambda} = h\frac{c}{\lambda_0} + \frac{1}{2}mv^2$	2		
			6	
	Substitution and finding $\frac{1}{2}mv^2 = 4.96 \times 10^{-19}$ J	4		