



(Eò) <sup>a</sup>ÉÉÉÉ VÉÉÉÉ ±ÉÉÉÉ :-

5

' + ' MÉ] ã

'**É**' **MÉ]**õ

- (1)  $\text{E} \vdash \text{E} \rightarrow \text{E}$
- (2)  $\text{E} \vdash \text{E}$
- (3)  $\text{E} \vdash \text{E} \rightarrow \text{E}$
- (4)  $\text{E} \vdash \text{E} \rightarrow \text{E}$
- (5)  $\text{E} \vdash \text{E} \rightarrow \text{E}$

- (+) EñĒ  
 (±) Ēē ēē } ō  
 (Eō) } ±ēē ō  
 (b) C±ēē  
 (<) °ēēē { ±ēē  
 (;ō) Eō = ēēēē Sēē@ū

2. JEE±E0+E{EEò EEdñEíE½)ññÉ |É¶×É °ÉEö-ÉE :-

16

- [illegible]

3. JEE+EO+E{EEd EdehiEz)OnfE JE9xE °EEb:E :-

16

- [illegible]

4.  $\int_{\mathbb{R}^n} f(x) dx = \int_{\mathbb{R}^n} f(x) dx$  (Erdős-Rényi) :-

16

- [illegible]

5.  $\int_0^1 \frac{1}{x^2} dx$  (Evaluating the integral) **SEE®** :—

16

- (+) 𐎠𐎡𐏁𐎧𐎺𐎠                      (𐎥) 𐎶𐎥𐎵𐎲𐎢𐎪                      (Eo) GAEo 𐎶𐎥𐎵 } o  
(b) 𐎠𐎶+<sup>®</sup>𐎶𐎥𐎵𐎲𐎢𐎪 + 𐎥𐎴𐎶𐎥𐎵𐎲𐎢𐎪                      (<) 𐎶𐎥𐎵𐎲𐎢𐎪𐎥𐎴.

6.  $J \in \mathbb{R}^{n \times n}$  is a symmetric matrix. Let  $\lambda_1, \lambda_2, \dots, \lambda_n$  be the eigenvalues of  $J$ . Show that  $\lambda_1 + \lambda_2 + \dots + \lambda_n = \text{tr}(J)$ .

16

- (+) if  $\partial E \subseteq \partial \Omega$  and  $\partial E \cap \partial \Omega \neq \emptyset$ , then  $\partial E \cap \partial \Omega \subseteq \partial \Omega$ .  
 (†)  $\partial E \cap \partial \Omega \subseteq \partial \Omega$  and  $\partial E \cap \partial \Omega \neq \emptyset$  imply  $\partial E \cap \partial \Omega \subseteq \partial \Omega$ .  
 (E)  $\partial E \cap \partial \Omega \subseteq \partial \Omega$  and  $\partial E \cap \partial \Omega \neq \emptyset$  imply  $\partial E \cap \partial \Omega \subseteq \partial \Omega$ .  
 (b)  $\partial E \cap \partial \Omega \subseteq \partial \Omega$  and  $\partial E \cap \partial \Omega \neq \emptyset$  imply  $\partial E \cap \partial \Omega \subseteq \partial \Omega$ .

**(ENGLISH)**

[ TIME ALLOWED—3 HOURS ]

(MARKS—100)

**TWO AND THREE WHEELER MECHANISM (THEORY-I)****Marks**

1. (a) Fill in the blanks with proper word from the bracket (any *five*) :— 5
- (i) ..... type of clutch is used for two wheeler.  
 (a) Dry (b) Wet (c) Dry and Wet.
- (ii) Cylinder diameter is known as .....  
 (a) Stroke (b) Diameter (c) Bore.
- (iii) S. I. Engine is also called as .....  
 (a) Comprition ignition (b) Spark Ignition,  
 (c) Suction Ignition.
- (iv) In ..... for lubrication oil is not mixed in petrol.  
 (a) Luna (b) Bajaj Scooter (c) Honda.
- (v) In motor cycle ..... type of clutch is used.  
 (a) Single Plate (b) Multiplate (c) Cone Clutch.
- (vi) ..... brakes system is used in two wheeler vehicle.  
 (a) Air (b) Hydraulic, (c) Mechanical.
- (b) State *true* or *false* (any *five*) :— 5
- (i) Ignition coil use in the horn circuit.
- (ii) Centrifugal type clutch mostly used in car.
- (iii) Brake shoe liner is made up of hard rubber.
- (iv) In four stroke cycle crank shaft moves 360 to complete one cycle.
- (v) In three wheeler air cooling system is used.
- (vi) In two wheeler constant mesh gear box is used.
- (c) Write full form of the following terms (any *five*) :— 5
- (i) B. D. C.
- (ii) T. D. C.
- (iii) F. H. P.
- (iv) B. H. P.
- (v) C. B. Point
- (vi) C. I. Engine.

[ Turn over

(d) Match the following :—

5

**' A ' Group**

- (i) Gear box
- (ii) Engine
- (iii) Brake System
- (iv) Carburettor
- (v) Ignition System

**' B ' Group**

- (a) Cam
- (b) Mainshaft
- (c) Float
- (d) Clutch
- (e) Spark Plug
- (f) Combustion Chamber.

2. Attempt any *two* of the following :—

16

- (a) State the braking principle and requirement of brakes.
- (b) Explain the wheel cylinder with neat sketch.
- (c) Give the working of belt drive.
- (d) Explain the working of clutch.

3. Attempt any *two* the following :—

16

- (a) Draw the lay-out of three wheeler service station and explain.
- (b) Write the construction and working of the air cleaner.
- (c) Explain the working construction of spark ignition engine.
- (d) Explain the Mechanical brake with neat sketch.

4. Answer the following question (any *two*) :—

16

- (a) State the function and construction of silencer.
- (b) Explain the shock absorber with neat sketch.
- (c) Write on dry sump lubrication system.
- (d) Give advantages and disadvantages of water cooling system.

5. Write short notes (any *four*) :—

16

- (a) Battery
- (b) Brake shoe
- (c) Crank shaft
- (d) Necessity of Gear Box
- (e) Brake principle.

6. Attempt any *two* of the following questions :—

16

- (a) Draw a circuit diagram of electric wiring of three wheeler.
- (b) Write a construction and working of four stroke engine.
- (c) Differentiate between two and four stroke engine.
- (d) Write the general safety precaution.