

# 17453

**21314**

**3 Hours / 100 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. a) Attempt any SIX of the following:**

**12**

- i) Give classification of wind mills.
- ii) State types of heat engine.
- iii) What is meant by firing order and firing interval?
- iv) Why turbocharger is used in I.C. engine?
- v) State the need of lubrication system.
- vi) List two major tractor manufacturers in India and give two models of each.
- vii) What are the functions of clutch?
- viii) State necessity of final drive and differential.
- ix) Give classification of brakes.

P.T.O.

b) Attempt any TWO of the following:

8

- i) Describe ways of collection of solar radiations.
- ii) Differentiate between floating gas holder type and fixed drum type biogas plant.
- iii) Draw schematic diagram of I.C. engine and label the major parts. Write functions of two major components.

2. Attempt any FOUR of the following:

16

- a) Describe the working of 4-S cycle engine.
- b) What is the effect of ignition advance and ignition retard on engine performance?
- c) Differentiate between petrol engine and diesel engine on the basis of:
  - i) Type of fuel used
  - ii) Power output
  - iii) Power to weight ratio
  - iv) Applications.
- d) Sketch and describe valve operating system.
- e) Describe with sketch working of centrifugal governor.
- f) What is the need of air cleaning? Describe oil bath type air cleaner.

**3. Attempt any FOUR of the following:****16**

- a) Differentiate between battery ignition and magneto ignition system. (Any four points)
- b) Sketch two types of valve arrangements used in I.C. engine.
- c) Draw neat diagram of magneto ignition system and describe its working.
- d) Give classification of lubricants.
- e) State four requirements of fuel injection system.
- f) List components of water cooling system and describe its working.

**4. Attempt any TWO of the following:****16**

- a) Draw a neat sketch of mechanical fuel injector and describe working of fuel injection system.
- b) Draw a schematic diagram of single plate clutch system and describe its construction and working.
- c) What is meant by steering geometry? Describe the factors affecting steering geometry of a tractor.

**5. Attempt any FOUR of the following: 16**

- a) State four major factors affecting selection of a tractor.
- b) Explain general idea adopted in manufacturing different H.P. ranges of tractors.
- c) Write causes and remedies for a trouble clutch slip.
- d) Describe the procedure for free play adjustment of a clutch.
- e) Draw neat sketch of differential unit and describe its working.
- f) What is P.T.O. shaft? Describe how it is used for power take-off.

**6. Attempt any FOUR of the following: 16**

- a) List four implements used with tractor along with their application. Describe how they are hitched with tractor?
  - b) Sketch hydraulic power steering system. Write functions of major components of hydraulic power steering system.
  - c) Describe working of hydraulic brake system.
  - d) What are the controls used in hydraulic system of a tractor?
  - e) Draw a layout of constant mesh gear box and describe its working.
  - f) State four basic characteristics of hydraulic fluid.
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