

GUJARAT TECHNOLOGICAL UNIVERSITY**Diploma Engineering - SEMESTER-II • EXAMINATION – SUMMER 2013****Subject Code: 320003****Date: 20-06-2013****Subject Name: Elements of Mechanical Engineering****Time: 2:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. English version is considered to be Authentic.

- Q.1** (a) Define Gear Train. State the types of gear train. Explain any one with neat sketch. **07**
- (b) (i) List the different accessories used in boiler and state the functions of each. **04**
(ii) Define Brazing. Compare between soldering and brazing process. **03**
- Q.2** (a) Define Boiler. Differentiate between fire tube boiler and water tube boiler. **07**
- (b) (i) Classify the internal combustion engine in details. **04**
(ii) Explain the working principle of impulse turbine. **03**
- OR**
- (b) (i) Give reasons and remedies for following faults in C.F. Pump: **04**
(A) No. of water is delivered, (B) Pump fail to start.
(ii) State the criteria of selection for material handling equipments. **03**
- Q.3** (a) Explain the working of Cochran boiler with neat sketch and label the parts. **07**
- (b) (i) State at least four limitations of Bernoulli's equation. **04**
(ii) Define the following terms: **03**
(A) Viscosity, (B) Surface tension, (C) Capillarity.
- OR**
- Q.3** (a) (i) The velocity of flat belt is 12 m/s and mass per meter of belt is 1.5 Kg. Belt tension on tight and slack side 2250 N and 850 N respectively. Find (A) **04**
Centrifugal tension, (B) Initial tension of the belt.
(ii) Define Welding. List the equipments used in gas welding. **03**
- (b) Explain the working principle of four stroke petrol engine with neat sketch. **07**
- Q.4** (a) State the formulas of weir V-Notch and Orifice for discharge measurement. **07**
Water flowing through 90° triangular notch with head of 0.8 m. Determine discharge through notch. Take $C_d = 0.6$.
- (b) (i) Explain working of steam engine with neat sketch. **04**
(ii) Define "Steam Engine". List the main component of steam engine. **03**
- OR**
- Q.4** (a) State the types of cranes. State the factors affecting the selection of cranes. Draw the sketch of any two cranes. **07**
- (b) (i) List the different types of I.C. Engine systems and state its function. **04**
(ii) State at least six uses of an I.C. Engine. **03**
- Q.5** (a) Classify the mechanical drives. State the advantages and disadvantages of 'V' belt compare to flat belt **07**
- (b) (i) A centrifugal pump develops head of 60 m. If power consumption of the pump is 40 Kw and efficiency of pump is 60%. Calculate discharge of the pump in liters/min. **04**
(ii) State the location and function of following mounting used in boiler: (A) **03**
Water level indicator (B) Pressure gauge (iii) Fusible plug.

OR

- Q.5 (a) Explain submerged arc welding process with neat sketch. 07
 (b) (i) Differentiate between centrifugal pump and reciprocating pump. 04
 (ii) Derive continuity equation. 03

- 4.1-1 2. "glyr 3en" ni VyaQya Aapo. glyr 3enna pkar j`avo. gmeteAe Aakit sh smjavo. 09
 4. k. bo{lr ma>vpratl jdl jdl Aeerlzna nam lqo Anedre nekayRj`avo. 08
 q. "bēlg" ni VyaQya Aapo. solDrig Andēlg pkyani srqam`l kro. 03
- 4.1-2 2. "bo{lr"ni VyaQya Aapo. Fayr 3yb Anevo3r 3yb bo{lrna tfavt j`avo. 09
 4. K. Aaer dhn Ae+nneivStt vglRr` kro. 08
 q. [MpLs 3baRno kayR@2a` smjavo. 03
- A4va
4. k. sēfygl ppnl nlcal qamlAona kar`o Anetēa]payo Aapo. 08
 k. Paa`lno in*kas 4to n4l.
 q. pp xru4to n4l. 03
 q.m3lrlyl hēl lēna sa2no psē krvana pirb5o j`avo.
- 4.1-3 2. kocrn bo{lrnekayRAakit sh smjavl tēa pr wago dxavo 09
 4. k. bnoRlna pnyeni AoOama>AoOl car myaRAo j`avo. 08
 q. nlceā pdoni VyaQya Aapo. 03
 (i) iSnG2nta, (ii) p*ta`, (iii) kēllarl3ls
- A4va
- 4.1-3 2. k. Flē bē3no vg 12 ml3r pīt skēD 0e AneAe ml3r bē3nā5 1.5 ik/ga/ 0ēbē3nā 08
 tē bajūAne!lll bajouta` Ankhe2250 NyuAne850 Nyu0e to kēlyagl ta` Ane
 bē3nāxraAatnēta` x02o. 03
 q. "vēDlē"ni VyaQya Aapo.>ge vēDlē ma>vprata sa2noni yadl lqo. 03
 4. Caar S3okva5a pēl Ae+nno kayR@2a` SvC0 Aakit sh smjavo. 09
- 4.1-4 2. vl noc, vlyr AneAorlfisna in*kas map`lna sūo j`avo. Ae 90° i|ko`akar noc 09
 pr4l 0.8 ml3r xl8Rē5 pa`l vhe0e to noc ma4l 4tl inkas x02o. Cd = 0.6. 08
 4. k. S3lm AeJlnnekayRAakit sh smjavo. 03
 q."S3lm AeJln" ni VyaQya Aapo. S3lm AeJlnna mōy Agona nam lqo.
- A4va
- 4.1-4 2. Kēna pkar j`avo. kēnnl psēgl neAsrkrta pirb5o j`avo. gmetebekēnnl 09
 Aakit doro. 08
 4. k. Aa{.sl. AeJlnnl iviv2 isS3mo j`avl drēnekayRj`avo. 03
 q. Aa{.sl. AeJlnna AoOama>AoOa 0]pyog j`avo.
- 4.1-4 2. imkēlkl D{vna vglRr` kro. flē bē3nl sapēma>vl bē3na faydaAo AnegefaydaAo 09
 j`avo. 08
 4. k. Ae sēfygl pp 60 ml3r pr kam krē0e je40 iklo vaRpavv vapre0e jo ppnl 03
 kayR@ta 60% hoy to ppno l13r pīt mlnl3 nl*kas x02o.
 q. nlceāxra bo{lr ma]N3lē na S45 AnekayRj`avo. 03
 (i) vo3r lēl {NDIkē, (ii) pēr gē, (iii) fyālb l Plg.
- A4va
- 4.1-4 2. sbmjRAakRvēDlē pīse Aakit sh smjavo. 09
 4. k. kēlyagl pp Anērēlpkēlg ppnl tūna kro. 08
 q. kN3lNyēl smikr` saibt kro. 03
