

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2024

Subject Code:3152201

Date:28-11-2024

Subject Name:Mine Machinery II

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

Marks

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|------------|---------------------------------------------------------------------------------------------------------------------------|-----------|
| Q.1 | (a) Draw the sketch of cage attachment to winding rope. | 03 |
| | (b) Explain Lofco system with neat sketch. | 04 |
| | (c) What is friction winder? State the advantages and disadvantages of multi-rope friction winder. | 07 |
| Q.2 | (a) What do you mean by angle of fleet? Explain with neat sketch. | 03 |
| | (b) What are the objectives of pit top & pit bottom layout? Also write the factors affecting pit top & pit bottom layout. | 04 |
| | (c) Write a brief note on centrifugal pump. | 07 |
| | OR | |
| | (c) What are the different methods of electrical braking of winders? Describe in detail. | 07 |
| Q.3 | (a) How the height of the headgear is decided? Also write the purpose of headgear. | 03 |
| | (b) Explain ward Leonard method of speed control in winders with neat sketch. | 04 |
| | (c) What is the role of safety detaching hook? Explain king detaching safety hook with neat sketch. | 07 |
| | OR | |
| Q.3 | (a) What is good about Simba Drill machine using in metal mine? | 03 |
| | (b) Explain Low Profile Dump Trucks (LPDT) with its features. Also write the name of its manufacturers. | 04 |
| | (c) Explain the following terms with neat sketch:
(a) Turntable Circuit (b) Back Shunt Circuit | 07 |
| Q.4 | (a) How torque is generated in winding? Also write the importance of Torque in winding system? | 03 |
| | (b) What are the advantages of using a coal cutting machine in a mine? | 04 |
| | (c) Describe the components or parts of Reciprocating pump in detail with diagram. | 07 |
| | OR | |
| Q.4 | (a) Write the factors affecting the selection of load haul dumper. Also state the advantages and disadvantages. | 03 |
| | (b) Explain loop type and Reversing track type layout for locomotive haulage. | 04 |
| | (c) Explain the working of Reciprocating Pump in detail. Also state its advantages and disadvantages. | 07 |
| Q.5 | (a) How carrying capacity of belt conveyor is calculated? Explain with one example. | 03 |
| | (b) Write a brief note on Armoured Face Conveyor (AFC). | 04 |
| | (c) A turbine pump is required to work under the following conditions; | 07 |

R.P.M = 1440, capacity of water discharge = 2700 litres/min, total head from all stage = 300 m., angle of blade tip = 30° (backward blade), efficiency = 70 %, radial velocity of water = 2 m /s

Find the no. of impeller and width of each impeller if the diameter of impeller is 35 cm.

OR

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|------------|------------|-----------------------------------------------------------------------------------------|-----------|
| Q.5 | (a) | Write a short note on side discharge loader. | 03 |
| | (b) | What are the factors affecting the design of belt conveyor? Also state its limitations. | 04 |
| | (c) | Explain the construction and operation of shearer. Also state its advantages. | 07 |
