

CBCS Scheme

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16/17MPD23

Second Semester M.Tech. Degree Examination, June/July 2018

Design for Manufacture

Time: 3 hrs.

Max. Marks: 80

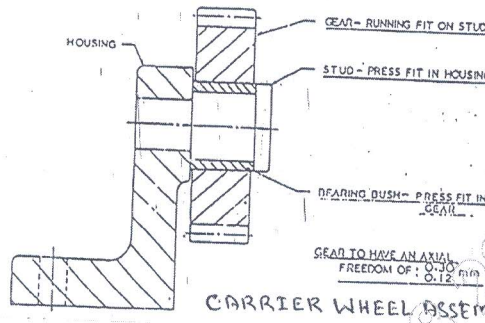
- Note:** 1. Answer FIVE full questions, choosing one full question from each module.
 2. Write neat sketches.
 3. Assume dimensions wherever necessary.

Module-1

- 1 a. Enumerate the general requirements of early materials and process selection. (10 Marks)
- b. List the advantages of DFMA. (06 Marks)

OR

- 2 a. A carrier wheel assembly is shown in Fig. Q2 (a). A steel gear wheel is fitted with a self lubricating type bearing bush, which rotates on a steel stud and is a press fit in the cast iron housing. The gear wheel when fitted have an axial freedom of movement of $\begin{matrix} 0.30 \\ 0.12 \end{matrix}$ mm. With neat sketch show the functional and non functional dimensions. Allocate tolerance to the component dimensions. The nominal size of the bush is 30 mm. Also determine the limits for the stud. General tolerance is ± 0.30 for non functional dimension. (11 Marks)

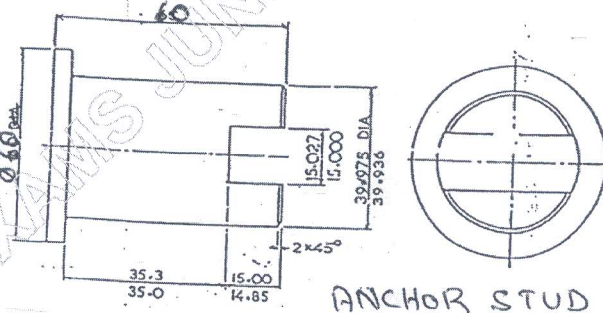


CARRIER WHEEL ASSEMBLY Fig. Q2 (a)

- b. Explain the procedure for changing the datum. (05 Marks)

Module-2

- 3 a. An anchor stud shown in Fig. Q3 (a) is to be manufactured in batches of 100. Identify the functional datum, datum face and corresponding functional dimensions. Show the possible datum faces for machining the 15 mm wide slot and draw the appropriate dimensional layout for each. (10 Marks)



ANCHOR STUD Fig. Q3 (a)

- b. Explain Dowels and Dowelling procedure. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 4 a. Fig. Q4 (a) shows a cast iron bearing bracket. With neat sketches, suggest suitable reduction of machined surface areas. (10 Marks)

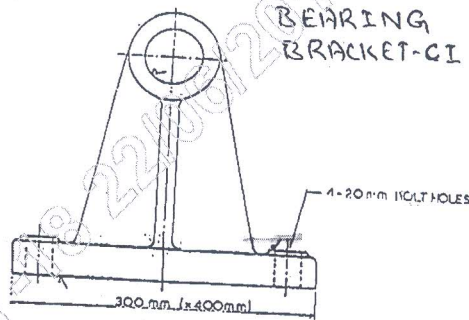


Fig. Q4 (a)

- b. Explain simplification by separation and amalgamation. (06 Marks)

Module-3

- 5 a. With neat sketches, explain cast holes and cored holes. (05 Marks)
 b. A flanged bush of CI has to be casted as shown in Fig. Q5 (b). Identify the possible parting lines and sand cores. Suggest a suitable design modification to remove the need of sand cores. Retain approximately the same weight. (11 Marks)

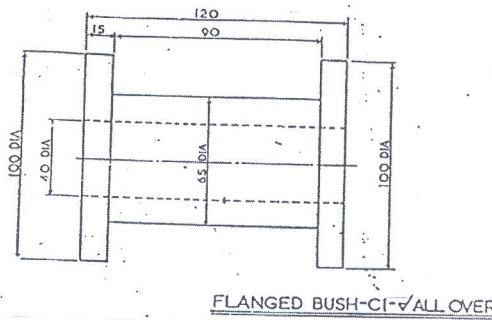


Fig. Q5 (b)

OR

- 6 a. Explain the designing to obviate sand cores. (05 Marks)
 b. A CI connecting bracket has to be casted as shown in Fig. Q6 (b). Identify the possible parting lines and sand cores. Suggest a suitable design modification to remove the need of sand cores. Retain the same weight approximately. (11 Marks)

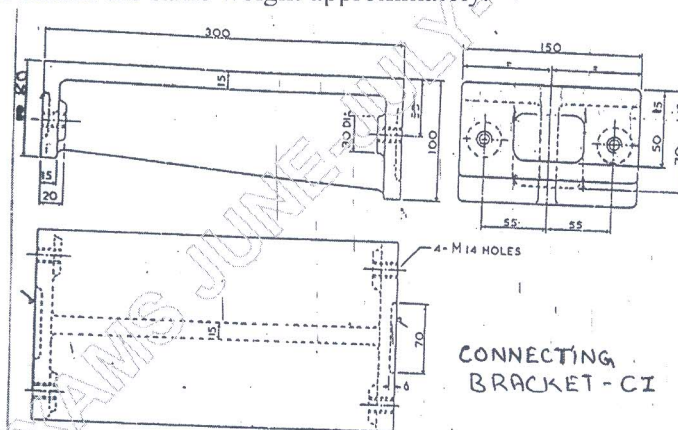


Fig. Q6 (b)

Module-4

- 7 a. Enumerate the design guidelines for injection molding process. (10 Marks)
 b. Write a note on: (i) Molding cycle. (ii) Insert molding (iii) Injection molding materials. (06 Marks)

OR

- 8 a. Explain the press selection for sheet metal working. (08 Marks)
b. Explain the following: (i) Dedicated dies and press working (ii) Sheet metal working. (08 Marks)

Module-5

- 9 a. Explain the design principles for Die casting process. (10 Marks)
b. Write short notes on : (i) Die casting alloys (ii) Assembly techniques. (06 Marks)

OR

- 10 a. With a flow chart, explain the powder metallurgy process. (08 Marks)
b. Write a note on: (i) Tooling for powder metallurgy (ii) Sintering processes. (08 Marks)

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