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SUPPLEMENTARY EXAMINATION

February-2019

BTECH – AUTO. ENGG

AE-207 Engineering Analysis and Design

Max. Time 3 Hr.

Max. Marks 40

Note: Answer ANY FIVE questions.

All questions carry equal marks.

Answer to each question must start on a fresh page.
Answers to all subparts of a question must be answered at one place.

Q.1 Write short notes on the following (Any FOUR)

- a) Comfort and adaptability
- b) Patentability
- c) Geographical Indicator
- d) Fishbone diagram
- e) Biomimicry
- e) Infringement of a patent

Q.2a. Explain the stages in the development of a product.

- b. What do you mean by nature inspired innovations? Describe any three examples of nature inspired innovations.

Q.3a. Explain the systematic design procedure. Explain various stages in the engineering problem solving.

- b. What do you understand by need, comfort and luxury? Describe suitable examples of each.

Q.4a. what are the different hats suggested by Edward De Bono for a brain storming session? Discuss their uses by a suitable example.

- b. What do you understand by provocation and movement? Describe with a suitable example.

Q.5a. Explain the applications of Jigad innovation giving suitable examples.

- b. Discuss the significance and the principles of ergonomics with a suitable example.

Q.6a. What are the principles of TRIZ innovation, Discuss the use of contradiction matrix.

- b. Find the size and fit for a shaft and a hole of $30^{+0.07}$. If the fundamental deviation for shaft is $5 D^{0.34}$ and the standard tolerance grades are as following: (standard tolerance $i = 0.45$

$\sqrt[3]{D} \pm 0.001D$) microns

tolerance grades	IT5	IT6	IT7	IT8	IT9	IT10	IT11	IT12
standard	7i	10i	16i	25i	40i	64i	100i	160i
tolerance multiple								

Diameter steps are 1-3, 3-6, 6-10, 10-18, 18-30, 30-50, 50-80, 80-120.