

Total No. of Questions – [3]

Total No. of Printed Pages: 2

G.R. No.	
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PAPER CODE	U483-242A (RE)
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**May 2023 (ENDSEM) EXAM**  
**B.Tech.(E& TC) (SEMESTER - II)**

**COURSE NAME: Deep Learning (Professional Elective V)**

**COURSE CODE: ETUA40182A**

**(Pattern -2018)**

Time: [1Hr]

[Max. Marks: 30]

**(\*) Instructions to candidates:**

- 1) Use of scientific calculator is allowed
- 2) Use suitable data where ever required
- 3) All questions are compulsory

- |           |  | Max<br>Marks | CO  | Blooms<br>Taxonom-<br>y<br>Level |
|-----------|--|--------------|-----|----------------------------------|
| Q.1)      | a) In a certain Engineering college probability of final year students appearing for campus interviews is 0.489 and probability of appearing for interviews and getting placed is 0.81. The probability of students placed given a number of students appearing is 65%. Calculate the probability of the students placed.  | (4)          | CO4 | Apply                            |
|           | b) In variational autoencoders ,if $x$ is observed variables and $z$ be set of latent variables with joint distribution $P(z,x)$ . Inference problem is to compute the conditional distribution of the latent variables given the observations, where<br>$P(z x) = \frac{P(x z)P(z)}{P(x)}$<br>Evaluating above equation is difficult since<br>$P(x) = \int_z P(x z)P(z)dz$ is intractable. Suggest a suitable solution to make above problem tractable. | (6)          | CO4 | Create                           |
| <b>OR</b> |  |              |     |                                  |
|           | c) In conditional VAE trained on deep learners famous CIFAR 10 database having objects distributed in 10 classes. The 10 different classes represent airplanes, cars, birds, cats, deer, dogs, frogs, horses, ships, and trucks. It is expected to generate a horse. There are four samples in latent space namely $z_1, z_2, z_3$ and $z_4$ . Construct the conditional VAE for the given   | (6)          | CO4 | Create                           |

requirements. Draw the complete concept diagram. What will be the size of latent vector?

- Q.2)**
- a) In context with the GAN, When the generator is optimal, calculate the minimum loss value that the discriminator can achieve? (4) CO5 Apply
  - b) Inspired by the Dutch painter V.M. Van Gogh, an Engineer cum artist wants to develop an application for desktop in which a picture will be translated into the Van Gogh style paintings. Suggest him a suitable deep learning architecture, draw and explain its working. (6) CO5 Create
- OR**
- c) Design a discriminator for a GAN with colour image of 64x64 pixels as an input, 4 convolution layers with filter size of 5x5 in each convolution layer and number of filters 64, 128, 256 and 512. (6) CO5 Create
- Q.3)**
- a) In a reinforcement based three step game reward at step 0 (initially) is 20, step 1 is -10 and step 2 is 30. Taking discount factor equal to 0.9, calculate the total reward.  
Total reward equation  $R_t = \gamma^0 r_t + \gamma^1 r_{t+1} + \gamma^2 r_{t+2} + \dots + \gamma^{t+n} r_{t+n}$  (4) CO6 Apply
  - b) Illustrate the entire reinforcement learning process using block diagram indicating all the components. (6) CO6 Understand
- OR**
- c) Illustrate with suitable example, how the deep learning networks are used in reinforcement learning applications with policy gradient technique. (6) CO6 Understand