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**MANIPAL INSTITUTE OF TECHNOLOGY**

**MANIPAL**

*A Constituent Institution of Manipal University*

**SECOND SEMESTER M.TECH. (PRINTING AND MEDIA TECHNOLOGY)**

**END SEMESTER EXAMINATIONS, APR/MAY 2017**

**ELECTIVE II - ADVANCES IN SPECIALTY PRINTING [PME 5235]**

**REVISED CREDIT SYSTEM**

**(27/04/2017)**

Time: 3 Hours

MAX. MARKS: 50

**Instructions to Candidates:**

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

- 1A.** Explain the following printing processes for Printed Electronics with neat sketches:
- a.** Optical Lithography
  - b.** Shadow Masking
  - c.** Laser Thermal Transfer Printing
  - d.** Micro Contact Printing
- 1B.** **a.** Explain the key challenges for engineering substrates for Printed Electronics.
- b.** Explain the key attributes for Printed Electronics.
- 1C.** Explain the criteria for selecting a RFID tag antenna.

**[ 04 + 04 + 02 ]**

- 2A.** Explain all attributes that makes Gravure and Screen Printing processes best suitable for Printed Electronics.
- 2B.** Explain the bottom contact OTFT with a neat diagram. Explain the factors that should be considered when selecting the deposition conditions in order to achieve high OTFT performance.
- 2C.** What motivates Printed Electronics? Explain.

**[ 04 + 03 + 03 ]**

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- 3A.** What is PEDOT:PSS? Explain the various methods of synthesizing PEDOT:PSS. How can you enhance the conductivity of PEDOT:PSS?
- 3B.** With a neat sketch, explain the working of an Organic Solar Cell.
- 3C.** Explain the production process of carbonless paper and its various compositions.

**[ 04 + 03 + 03 ]**

- 4A.** Explain the working of following types of 3D printers with neat diagrams:
- Stereo-lithography 3D printer
  - Selective laser sintering 3D printer
- 4B.** M/s Supreme Press Ltd, received an order for printing 3 part mailer using three different papers. The size of single mailer is 7 inch x 3 inch and the order quantity is 350000. The substrate for 1st, 2nd and 3rd part is 80 gsm, 70 gsm and 60 gsm respectively. The paper roll available for 1st and 2nd part is of size 16 inch and that of 3rd part is 18 inch. If the printer plans to print this job in a single roll web offset machine using double punch, what will be the total paper requirement for completing this order, by considering 4% of wastage allowance for make ready. Both 22 inch and 24 inch printing units are available, select the best one to reduce the paper wastage.
- 4C.** Explain four security features offered through holograms with suitable examples.

**[ 04 + 04 + 02 ]**

- 5A.** **a.** Generate 11 mod check digits for serial number starting from 264751 to 264760. Use weighted factor as 3-4-3-4-3-, sum of the digits and DSR method.
- b.** Explain the production process of lenticular printing.
- 5B.** Explain the working of three part roll to set collating process with carbon insertion.
- 5C.** Explain the production work flow for envelope making.

**[ 04 + 03 + 03 ]**