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**Pharmacology paper**

**Question Number 1**

**Answer (a):**

**Pain in edema reduction by Cryotherapy**

Cryotherapy gives a therapeutic affection in reduction of pain and decreasing edema through Lewis Hunts phenomena and GMT

Ice🡪 body🡪vasoconstriction🡪brain🡪vasodilation 🡪 closes anastomosis 🡪edema diffuses through capillaries from injured part🡪 surrounding tissue🡪reduction in edema occurs

Increased blood flow washout the accumulated wastes and edema reduced

**Pain**

Cryotherapy activates the cold receptor of body which are large diameter nerve fiber and suppresses the small diameter nerve fiber (pain) through **Gate Mechanism Theory** pain is reduced**.**

**Synergists Mechanism**

Glucocorticoids (non-inflammatory steroids ) and

Aspirin NSAIDs (pain and edema is cordial signs of inflammation so through NSAIDs 🡪 **block🡪 COX🡪 no mediator** 🡪no inflammation

**Antagonists**

Alpha blockers (ergotamine) increase peripheral vasodilation due to which excessive accumulation of blood or local edema

**PART B,**

**Therapeutic effect Systemic heat**

It helps in reduction of muscle/joint pain and stiffness

Example whirlpool

**Agents which affect its response**

Opioids and non-opioids analgesics and muscle relaxants helps in boosting its therapeutic affect

**But**

Alpha 1 antagonist and calcium channel blocker users are affected by systemic heat as it causes hypotension

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**Question 2**

**Answer Function of menstrual cycle**

It’s main: function is preparing uterus for pregnancy and making pregnancy possible

**PHASES**

**1 Follicular phase**

Anterior pituitary 🡪releases **FSH**🡪signal to ovaries🡪synthesis and mature the follicles present in the ovaries (1 follicle matures and produces ovum)

**FSH** during follicular stimulation also produces **estrogen** (thicken the lining uterus wall)

Also known as proliferation phase

**2, Ovulation phase**

On midpoint of Menstrual cycle (14 day) ovulation starts. Large amount **LH** is released from anterior pituitary, **LH raptures the follicle and ovum is released** .Ovum moves to uterus through fallopian tube ( small amount of FSH is also released in this phase )

**3, luteal phase**

**Corpus luteam** (infusion of remaining follicle with lipid) continues to grow developed during 1 week and secretes **estrogen and progesterone** (which helps in vascularization and glandular formation and thickening of uterus wall, to secure the fertilized ova)

**Progesterone**: increases pregnancy chances

**4, Corpus luteam regression and termination phase:**

If egg is fertilized🡪implantation🡪pregnancy start

But

If egg is unfertilized then corpus luteum will burst (due to lackage of **LH and FSH**) no further release of estrogen and progesterone**, endometrium lining breaks and bleeding start,**

**Which indicates the end of one reproductive cycle and start of second.**

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**Question 3:**

**Answer: Effects of glucocorticoids on muscle, protein and lipid metabolism;**

In **muscle cell in fat cell**

Decrease glucose uptake increase fate breakdown

Increase protein breakdown reduce glucose uptake

Releases Amino acid releases free fatty acid

These two sub units (A.A and Fatty acid) start the process of gluconeogenesis in liver. If glucose is required it will be released and excess amount will be stored as glycogen

**Part: B**

**Balance of plasma volume by Mineralocorticoids:**

Adrenal gland releases Aldosterone, whenever there is decrease in blood pressure or blood volume, than aldosterone binds to receptor🡪 create Hormone receptor complex🡪in cysytol🡪 translation occur 🡪 specific protein synthesis🡪 increases Na permeability 🡪electrochemical gradient is formed🡪K leaks and Na actively reabsorption 🡪increases osmolality 🡪

Increases blood volume 🡪 B.P back to normal and in this way plasma volume is balanced

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**Question 4**

**Answer Diabetes mellitus type 1 nd 2**

|  |  |
| --- | --- |
| **Type 1** | **Type 2** |
| No insulin is produced due to destruction of B-cells. | Body shows resistance towards produced insulin |
| Children ,young age | adult ,old |
| No family history | Family history |
| Insulin dependent | Non dependent |
| Lispro ,lente (drugs) | Metformin,glyburide |

**Part: B**

**Effective insulin delivery method**

There are three main type of administering/delivering insulin

1 **subcutaneous injection** (Standard)

2, **portable pen sized injector** (facilitates in subcutaneous injection)

**3, continuous subcutaneous insulin infusion device**

All of the above if beneficial on controlling the glucose level of body but this infusion device is most efficient because it is attached to body (24hrs) which monitors the change in the body glucose and provide a steady stream of insulin, moreover it is adjustable regarding to requirement ( i.e. prior to meal or exercise) so there is no need of applying multiple insulin injection.

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**Question5**

**Answer (A)**

**IONTOPHORESIS**

**Ionto🡪 ion And Phoresis🡪transfer**

“A technique in which direct electric current is used to transfer the ions into the body/skin”

Drug is ionized through electrical stimulation and is placed under the electrodes, the with the help of electrical stimulation drug is moved to the skin

**Mechanism**

Drug (molecule or gel) is applied to skin, electrodes are placed that is on one side (cathode and anode on other )by applying electrical stimulation drug become ionized .

As we know that +charge moves towards –charge ,so cathodes helps in the movement drug due to this pressure created by difference in polarity it enhances the absorption of drug into cells and tissue

**PART B,**

**Mechanism of hormone release and inhibition:**

Hormones are chemical messengers which are released from endocrine system to main internal homeostasis, so

Whenever there is a biological need (fall in glucose level)

**Stimulus to pancreas**

Recognition of need (glucose)

**Synthesis and release of glucagon** (pancreas🡪 secretory cells) negative feedback

liver releases glucose into the bloodstream

Interact with target cells

When glucose level is increased

Inhibitory signal to stop further release

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